DEPARTMENT OF THE ARMY
TECHNICAL MANUAL

DEPARTMENT OF THE AIR
FORCE TECHNICAL ORDER

TM 11-830A
TO 16-30SRTI-5

RADIO TRANSMITTING SET

AN/SRT-1A

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
MARCH 1952

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RADIO TRANSMITTING SET

AN/SRT–1A

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DEPARTMENTS OF THE ARMY
AND THE AIR FORCE

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CONTENTS

		Paragraphs	Page
CHAPTER 1.	**INTRODUCTION**		
Section I.	General	1, 2	1
II.	Description and data	3–10	1
CHAPTER 2.	**OPERATING INSTRUCTIONS**		
Section I.	Installation of Radio Transmitting Set AN/SRT–1A.	11–16	9
II.	Controls and instruments	17, 18	14
III.	Operation under usual conditions	19–24	18
CHAPTER 3.	**ORGANIZATIONAL MAINTENANCE INSTRUCTIONS**		
Section I.	Preventive maintenance services	25–28	30
II.	Lubrication and weatherproofing	29–30	33
CHAPTER 4.	**THEORY OF RADIO TRANSMITTING SET AN/SRT–1A**	31–38	36
CHAPTER 5.	**FIELD MAINTENANCE INSTRUCTIONS**		
Section I.	Trouble shooting at field maintenance level	39–47	47
II.	Repairs	48–50	57
III.	Alinement and final testing	51–56	59
CHAPTER 6.	**SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE**		
Section I.	Shipment and limited storage	57–59	62
II.	Demolition of matériel to prevent enemy use	60, 61	62
APPENDIX I.	**REFERENCES**		64
II.	**IDENTIFICATION TABLE OF PARTS**		66
INDEX			78

EMERGENCY

FOR OPERATION OF THIS EQUIPMENT ABOARD A LIFEBOAT READ PARAGRAPHS 19, 20, 21, AND 22.

EMERGENCY

WARNING

HIGH VOLTAGE

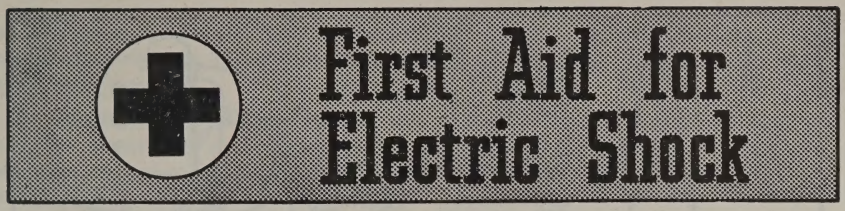
is used in the operation of

this equipment.

DEATH ON CONTACT

may result if operating personnel

fail to observe safety precautions.



RESCUE.

In case of electric shock, shut off the high voltage at once and ground the circuits. If the high voltage cannot be turned off without delay, free the victim from contact with the live conductor as promptly as possible. Avoid direct contact with either the live conductor or the victim's body. Use a dry board, dry clothing, or other nonconductor to free the victim. An ax may be used to cut the high-voltage wire. Use extreme caution to avoid the resulting electric flash.

SYMPTOMS.

a. Breathing stops abruptly in electric shock if the current passes through the breathing center at the base of the brain. If the shock has not been too severe, the breath center recovers after a while and normal breathing is resumed, provided that a sufficient supply of air has been furnished meanwhile by artificial respiration.

b. The victim is usually very white or blue. The pulse is very weak or entirely absent and unconsciousness is complete. Burns are usually present. The victim's body may become rigid or stiff in a very few minutes. This condition is due to the action of electricity and is not to be considered rigor mortis. Artificial respiration must still be given, as several such cases are reported to have recovered. The ordinary and general tests for death should never be accepted.

TREATMENT.

a. Start artificial respiration immediately. At the same time send for a medical officer, if assistance is available. Do not leave the victim unattended. Perform artificial respiration at the scene of the accident, unless the victim's or operator's life is endangered from such action. *In this case only,* remove the victim to another location, but no farther than is necessary for safety. If the new location is more than a few feet away, artificial respiration should be given while the victim is being moved. If the method of transportation prohibits the use of the Shaeffer prone pressure method, other methods of resuscitation may be used. Pressure may be exerted on the front of the victim's diaphragm, or the direct mouth-to-mouth method may be used. Artificial respiration, once started, must be continued, without loss of rhythm.

b. Lay the victim in a prone position, one arm extended directly overhead, and the other arm bent at the elbow so that the back of the hand supports the head. The face should be turned away from the bent elbow so that the nose and mouth are free for breathing.

c. Open the victim's mouth and remove any foreign bodies, such as false teeth, chewing gum, or tobacco. The mouth should remain open,

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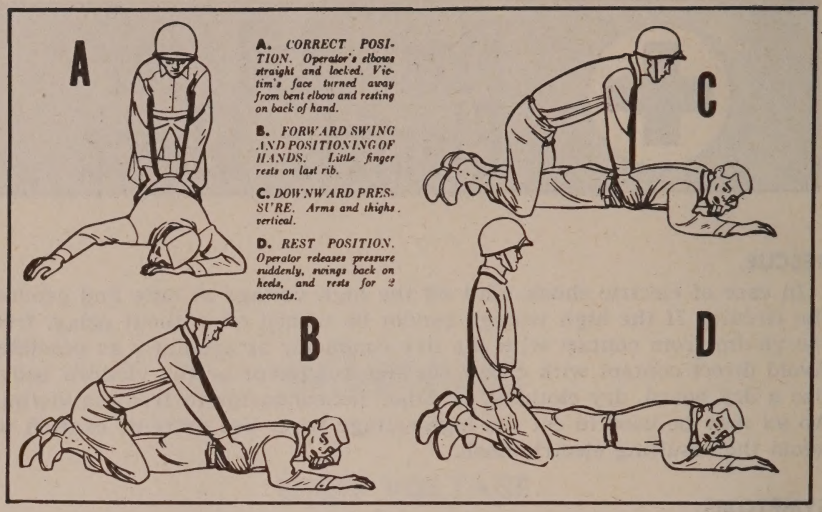
A
B
C
D
A. CORRECT POSITION. Operator's elbows straight and locked. Victim's face turned away from bent elbow and resting on back of hand.
B. FORWARD SWING AND POSITIONING OF HANDS. Little finger rests on last rib.
C. DOWNWARD PRESSURE. Arms and thighs vertical.
D. REST POSITION. Operator releases pressure suddenly, swings back on heels, and rests for 2 seconds.

with the tongue extended. Do not permit the victim to draw his tongue back into his mouth or throat.

d. If an assistant is available during resuscitation, he should loosen any tight clothing to permit free circulation of blood and to prevent restriction of breathing. He should see that the victim is kept warm, by applying blankets or other covering, or by applying hot rocks or bricks wrapped in cloth or paper to prevent injury to the victim. The assistant should also be ever watchful to see that the victim does not swallow his tongue. He should continually wipe from the victim's mouth any frothy mucus or saliva that may collect and interfere with respiration.

e. The resuscitating operator should straddle the victim's thighs, or one leg, in such manner that:

(*1*) the operator's arms and thighs will be vertical while applying pressure on the small of the victim's back;

(*2*) the operator's fingers are in a natural position on the victim's back with the little finger lying on the last rib;

(*3*) the heels of the hands rest on either side of the spine as far apart as convenient without allowing the hands to slip off the victim;

(*4*) the operator's elbows are straight and locked.

f. The resuscitation procedure is as follows:

(*1*) Exert downward pressure, not exceeding 60 pounds, for 1 second.

(*2*) Swing back, suddenly releasing pressure, and sit on the heels.

(*3*) After 2 seconds, swing forward again, positioning the hands exactly as before, and apply pressure for another second.

g. The forward swing, positioning of the hands, and the downward pressure should be accomplished in one continuous motion, which requires 1 second. The release and backward swing require 1 second. The addition of the 2-second rest makes a total of 4 seconds for a complete cycle. Until the operator is thoroughly familiar with the correct cadence

TL15338-B

of the cycle, he should count the seconds aloud, speaking distinctly and counting evenly in thousands. Example: one thousand and one, one thousand and two, etc.

h. Artificial respiration should be continued until the victim regains normal breathing or is pronounced dead by a medical officer. Since it may be necessary to continue resuscitation for several hours, relief operators should be used if available.

RELIEVING OPERATOR.

The relief operator kneels beside the operator and follows him through several complete cycles. When the relief operator is sure he has the correct rhythm, he places his hands on the operator's hands without applying pressure. This indicates that he is ready to take over. On the backward swing, the operator moves and the relief operator takes his position. The relieved operator follows through several complete cycles to be sure that the new operator has the correct rhythm. He remains alert to take over instantly if the new operator falters or hesitates on the cycle.

STIMULANTS.

a. If an inhalant stimulant is used, such as aromatic spirits of ammonia, the individual administering the stimulant should first test it himself to see how close he can hold the inhalant to his own nostril for comfortable breathing. Be sure that the inhalant is not held any closer to the victim's nostrils, and then for only 1 or 2 seconds every minute.

b. After the victim has regained consciousness, he may be given hot coffee, hot tea, or a glass of water containing ½ teaspoon of aromatic spirits of ammonia. *Do not give any liquids to an unconscious victim.*

CAUTIONS.

a. After the victim revives, keep him LYING QUIETLY. Any injury a person may have received may cause a condition of shock. Shock is present if the victim is pale and has a cold sweat, his pulse is weak and rapid, and his breathing is short and gasping.

b. Keep the victim lying flat on his back, with his head lower than the rest of his body and his hips elevated. Be sure that there is no tight clothing to restrict the free circulation of blood or hinder natural breathing. Keep him warm and quiet.

c. A resuscitated victim must be watched carefully as he may suddenly stop breathing. *Never leave a resuscitated person alone until it is CERTAIN that he is fully conscious and breathing normally.*

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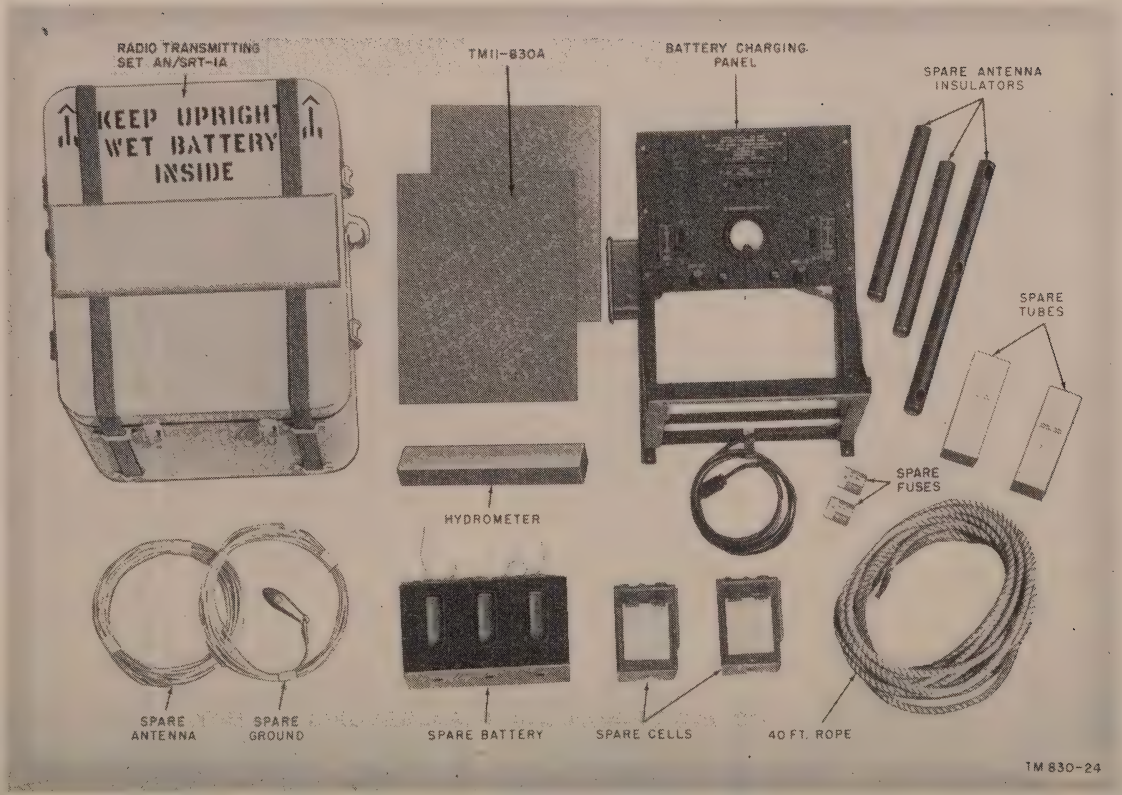


Figure 1. Radio Transmitting Set AN/SRT-1A with accessory equipment.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

This manual contains instructions for the installation, operation, maintenance, and repair of Radio Transmitting Set AN/SRT–1A (fig. 1). In addition to these instructions there are two appendixes covering a list of references and an identification table of parts.

Note. Throughout the manual this equipment is referred to as Radio Transmitting Set AN/SRT–1A, although the nameplate on the equipment reads Radio Transmitter AN/SRT–1A.

2. Forms and Records

The following forms will be used for reporting unsatisfactory conditions of Army matériel and equipment.

a. DD Form 6, Report of Damaged or Improper Shipment, will be filled out and forwarded as prescribed in SR 745–45–5.

b. DA AGO Form 468, Unsatisfactory Equipment Report, will be filled out and forwarded to the Office of the Chief Signal Officer as prescribed in SR 700–45–5.

c. DA AGO Forms 11–238 and 11–239, First, Second, and Third Echelon Maintenance Checklist for Signal Corps Equipment, will be prepared in accordance with instructions on the back of the form.

d. Use other forms and records as authorized.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

a. Radio Transmitting Set AN/SRT–1A (fig. 1) is a self-contained, portable transmitter for use in a lifeboat when ship is abandoned. Provision is made for either automatic transmission of SOS signals or manual code transmission. Included as part of

the equipment is a battery-charging panel, which is used aboard ship to maintain the correct charge in the transmitter batteries.

b. The transmitter can operate automatically for 2 minutes each time the START SWITCH is pushed in and held for a few seconds. Three SOS signals and a long dash are repeated six times over a 2-minute period, at the end of which time the transmitter automatically shuts down. If the START SWITCH is pushed only once each hour, the transmitter will operate for 2 days before the batteries are discharged. The average range is from 50 to 100 miles over sea, depending on atmospheric conditions. The frequency of operation is 500 kc (kilocycles).

4. Technical Characteristics

a. RADIO TRANSMITTING SET AN/SRT–1A.

Frequency	500 kc (600 meters).
Transmitter type	Mo (master oscillator) pa (power amplifier).
Type of signal transmitted.	Icw (interrupted continuous wave).
Distance range	50 to 100 miles over sea water.
Type of modulation	Amplitude.
Number of tubes	2.
Power input	6 volts, 14.5 amperes dc (direct current).
Power output	5 watts (approx).
Antenna	50 ft of wire rope erected to run from stem to topmast, and then to aft section of boat, with insulator at each end and at topmast.
Power supply	6-volt storage battery through vibrator power supply.
Weight	60 pounds.

b. BATTERY-CHARGING PANEL.

Type	Resistance.
Power input	115 volts dc at .5 or 1 ampere. 230 volts dc at .5 ampere.
Power output	6 volts dc at .5 or 1 ampere depending on power input.
Power source	Ship's 115- or 230-volt d-c line.

5. Table of Components

(figs. 1, 2, 3, and 4)

Components	Required No.	Height (in.)	Depth (in.)	Length (in.)	Volume (cu ft)	Weight (lb)
Radio Transmitting Set AN/SRT–1A.	1	18	12	16	2.0	60
Battery BB–54–A (3 in use, 5 spares).	8	3	5½	3 31/32	.038	4.5
Battery-charging panel	1	20¼	8¼	14½	1.4	16
Hydrometer	1	2	2	13½	.0312	0.25
Battery box (1 in use, 1 spare).	2	1 3/16	4 9/16	9⅝	.021	0.2
Antenna wire (1 in use, 1 spare).	2			50 ft		1⅞
Ground wire (1 in use, 1 spare).	2			20 ft		1 5/16
Strain insulators (2 in use, 2 spares).	4			11		5/16
Topmast insulators (1 in use, 1 spare).	2			16		½
Dummy antenna capacitor	1					
Vibrator (1 in use, 1 spare)	2	3⅛		1 9/16 dia		⅜
Tube type 1624 (2 in use, 3 spares).	5					
Glow lamp for tuning indicator (1 in use, 2 spares).	3					
Fuse (2 in use, 10 spares)	12					
Rope	1			40 ft		1¾
Technical Manual	2					

Note. This list is for general information only. See appropriate supply publications for information pertaining to requisitions of spare parts.

6. Packaging Data

a. When packed for export shipment, the components of Radio Transmitting Set AN/SRT–1A are placed in three moistureproof-vaporproof containers (fig. 5) and are packed in a wooden export case. A second wooden crate contains a 1-gallon bottle of electrolyte packed in accordance with specification JAN–P–207. The size, weight, and volume of the crates are given in the chart which follows.

Note. Items may be packaged in a manner different from that shown, depending on supply channel.

Number of crates	Height (in.)	Width (in.)	Depth (in.)	Volume (cu ft)	Weight (lb)
1	16	24	46½	10.33	150
1 (electrolyte)	18¾	9¼	11¼	1.13	40

b. The contents of each container packed in the larger wooden crate are listed on figure 5 and on a packing list attached to each container.

7. Description of Radio Transmitting Set AN/SRT–1A

a. Radio Transmitting Set AN/SRT–1A is a portable, battery-operated, 500-kc transmitter for use in a lifeboat when ship is abandoned. It comes installed in a small watertight suitcase (fig. 2) which will float. The suitcase has 40 feet of rope lashed to it and a pair of web straps around it. The straps are supplied for lashing the unit to a thwart in the lifeboat. The rope can be used to lower the suitcase into a lifeboat already in the water.

b. Figure 3 shows the transmitter with the watertight cover removed. All operational controls are mounted on the front panel. The retaining strip across the battery compartment may be removed to allow access to the batteries and the vibrator power supply located behind the batteries. A spare vibrator, spare antenna and ground wires, and a spare set of antenna insulators are shown in the compartments on either side of the battery compartment. An artificial-antenna capacitor is included for test purposes aboard ship. A spare tube and spare lamp for the TUNING INDICATOR are mounted within the transmitter.

8. Description of Battery-charging Panel

a. The battery-charging panel (fig. 4) is supplied to keep the batteries in the transmitter charged at all times. The battery-charging panel is designed to operate aboard ship from a 115- or 230-volt d-c power source and may be changed from one voltage to the other by operating the panel-mounted LINE VOLTAGE switch. The other operational controls are also mounted on the panel.

b. In the lower part of the charging panel is a rack for the battery tray. Coming from the bottom of the panel is a cord terminated in a female plug which may be plugged into the CHARGING RECEPTACLE on the transmitter to charge the batteries in the transmitter without removing them. A hydrometer is supplied to check the batteries.

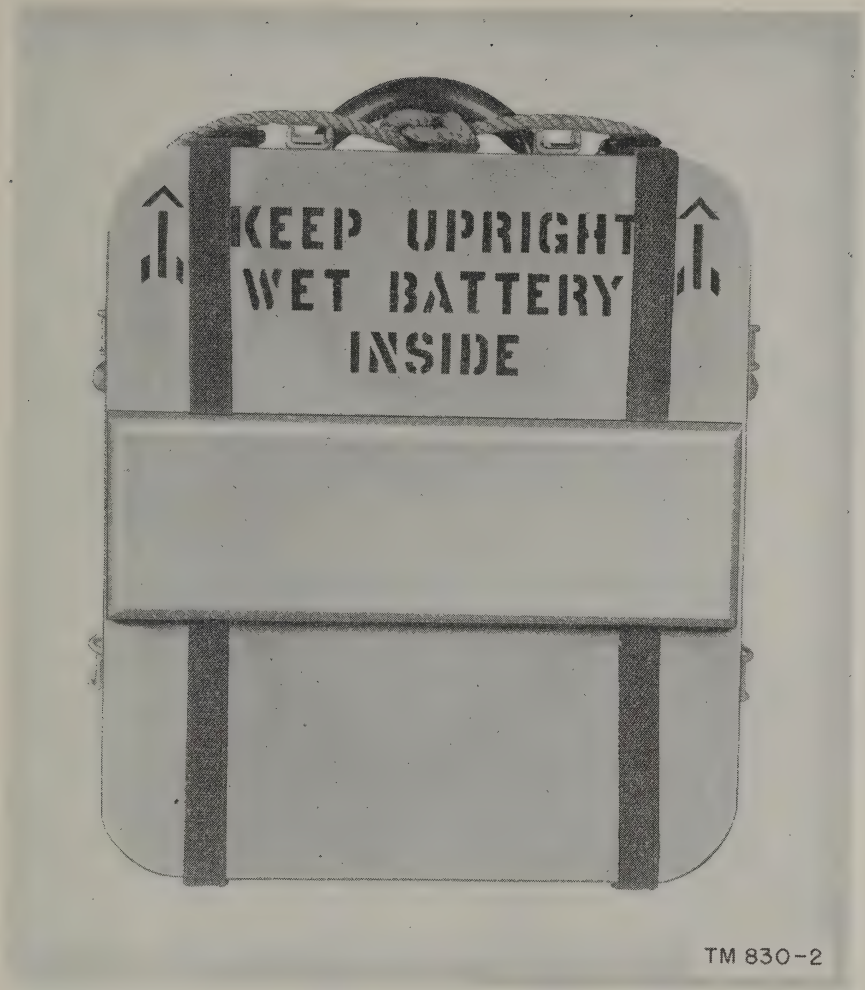


Figure 2. Radio Transmitting Set AN/SRT–1A.

9. Running Spares

A group of running spares is supplied with each transmitter (par. 5). Some of these are supplied loose and are to be stored wherever it is convenient; a definite disposition is prescribed for others, as described below:

a. Three of the spare battery cells are to be assembled and installed in the battery-charging panel as a spare battery (pars. 13 and 28). Two of the spare cells are to be stored dry in the vicinity of the battery-charging panel (par. 28).

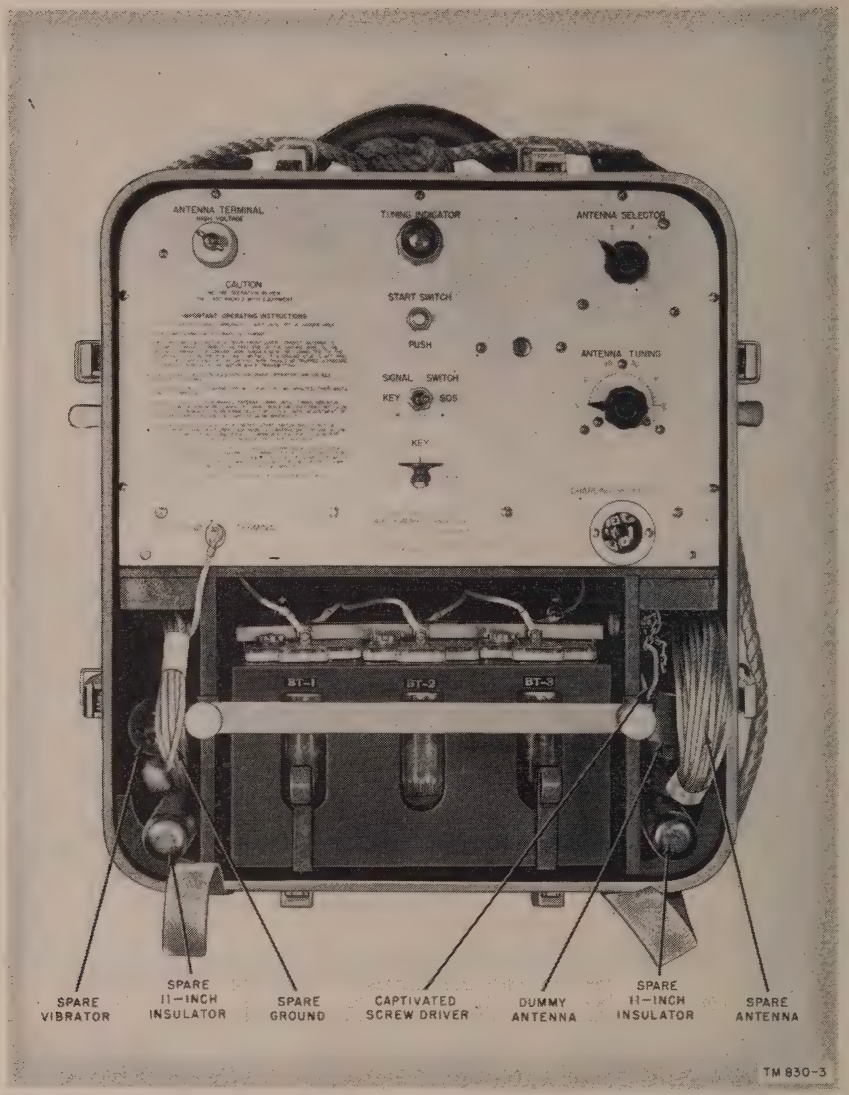


Figure 3. Radio Transmitting Set AN/SRT–1A, cover removed.

b. One of the spare tubes is to be installed in the SPARE TUBE socket in the transmitter (par. 14*b*). Two of the spare tubes may be stored in the transmitter compartments next to the battery (par. 14*g*).

c. One of the spare glow lamps for the tuning indicator is shipped installed in clips on the keyer unit (fig. 10). The other spare lamp may be stored in the transmitter compartments (par. 14*g*).

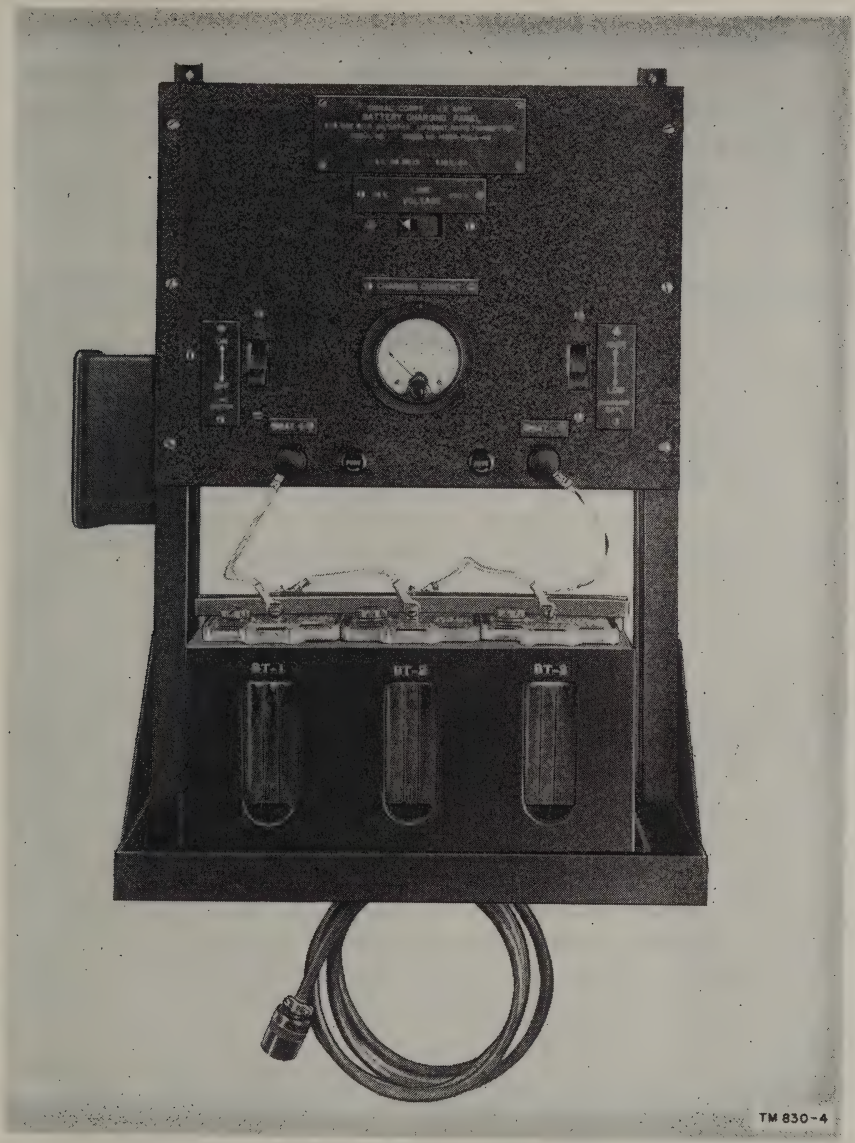


Figure 4. Battery-charging panel.

d. The spare antenna wire, ground wire, insulators, and vibrator may be stored in the transmitter compartments (par. 14*g*).

e. The spare fuses for the charging panel may be stored in any convenient location.

10. Differences in Models

a. Radio Transmitting Set AN/SRT–1A is similar in appearance and identical in operation to lifeboat radio transmitter (Radiomarine Corporation of America model ET–8026). The only differences are in the materials used. All circuit components are interchangeable, and the keyers are interchangeable as complete units, but the separate parts are not interchangeable.

b. The battery-charging panel for use with Radio Transmitting Set AN/SRT–1A is similar in appearance and operation to battery-charging panel (Radiomarine Corporation of America type RM–16) except that a LINE VOLTAGE switch has been included to facilitate changes in line voltage. Materials used in the construction are different, and the parts are not interchangeable, but the use of the equipment is the same.

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. INSTALLATION OF RADIO TRANSMITTING SET AN/SRT–1A

11. General Considerations

Normally, the charging panel will be installed aboard ship in the radio room or some other convenient place, and the transmitter will be stowed nearby and kept in readiness for emergency use in a lifeboat. Consideration must be given to both shipboard and lifeboat operation of the equipment.

12. Uncrating, Unpacking and Checking

a. When packed for export shipment, Radio Transmittting Set AN/SRT–1A consists of two nailed wooden crates. The larger crate contains the radio transmitter, battery-charging panel, and associated equipment. The smaller wooden crate contains a 1-gallon bottle of electrolyte which is used to fill the storage batteries.

b. The larger wooden crate contains three corrugated containers. One container has Radio Transmitting Set AN/SRT–1A inclosed, the second container has the battery-charging panel inclosed, and the third container holds associated equipment. The contents of each corrugated container are listed in figure 5.

c. To unpack the crates, first cut the wire straps around the wooden crates. Then, using a nail puller, remove the top and one side of each wooden crate. Be careful not to damage the contents by carelessly breaking the crates. After the top and one side of each crate have been removed, the corrugated containers inclosed may be removed and opened. Be careful not to puncture the corrugated containers while removing them. It is suggested that the packing boxes and material be saved, if feasible, for possible reshipment of the equipment at some future date.

d. After the equipment has been unpacked, check it against the packing list to be sure that nothing is missing; examine the equipment carefully for any damage which may have been incurred during shipment.

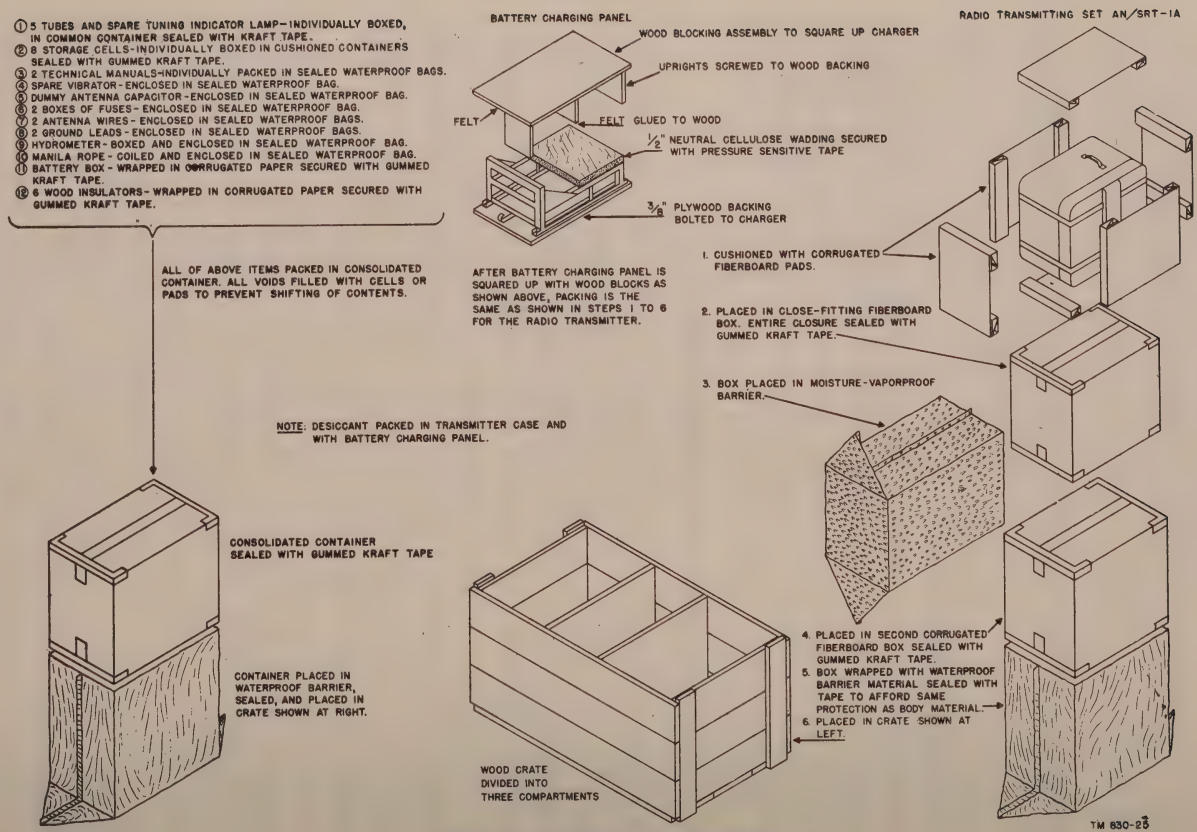

① 5 TUBES AND SPARE TUNING INDICATOR LAMP - INDIVIDUALLY BOXED, IN COMMON CONTAINER SEALED WITH KRAFT TAPE.
② 8 STORAGE CELLS - INDIVIDUALLY BOXED IN CUSHIONED CONTAINERS SEALED WITH GUMMED KRAFT TAPE.
③ 2 TECHNICAL MANUALS - INDIVIDUALLY PACKED IN SEALED WATERPROOF BAGS.
④ SPARE VIBRATOR - ENCLOSED IN SEALED WATERPROOF BAG.
⑤ DUMMY ANTENNA CAPACITOR - ENCLOSED IN SEALED WATERPROOF BAG.
⑥ 2 BOXES OF FUSES - ENCLOSED IN SEALED WATERPROOF BAG.
⑦ 2 ANTENNA WIRES - ENCLOSED IN SEALED WATERPROOF BAGS.
⑧ 2 GROUND LEADS - ENCLOSED IN SEALED WATERPROOF BAGS.
⑨ HYDROMETER - BOXED AND ENCLOSED IN SEALED WATERPROOF BAG.
⑩ MANILA ROPE - COILED AND ENCLOSED IN SEALED WATERPROOF BAG.
⑪ BATTERY BOX - WRAPPED IN CORRUGATED PAPER SECURED WITH GUMMED KRAFT TAPE.
⑫ 6 WOOD INSULATORS - WRAPPED IN CORRUGATED PAPER SECURED WITH GUMMED KRAFT TAPE.
ALL OF ABOVE ITEMS PACKED IN CONSOLIDATED CONTAINER. ALL VOIDS FILLED WITH CELLS OR PADS TO PREVENT SHIFTING OF CONTENTS.
BATTERY CHARGING PANEL
WOOD BLOCKING ASSEMBLY TO SQUARE UP CHARGER
UPRIGHTS SCREWED TO WOOD BACKING
FELT
FELT GLUED TO WOOD
1/2" NEUTRAL CELLULOSE WADDING SECURED WITH PRESSURE SENSITIVE TAPE
3/8" PLYWOOD BACKING BOLTED TO CHARGER
AFTER BATTERY CHARGING PANEL IS SQUARED UP WITH WOOD BLOCKS AS SHOWN ABOVE, PACKING IS THE SAME AS SHOWN IN STEPS 1 TO 6 FOR THE RADIO TRANSMITTER.
RADIO TRANSMITTING SET AN/SRT-1A
1. CUSHIONED WITH CORRUGATED FIBERBOARD PADS.
2. PLACED IN CLOSE-FITTING FIBERBOARD BOX. ENTIRE CLOSURE SEALED WITH GUMMED KRAFT TAPE.
3. BOX PLACED IN MOISTURE-VAPORPROOF BARRIER.
NOTE: DESICCANT PACKED IN TRANSMITTER CASE AND WITH BATTERY CHARGING PANEL.
CONSOLIDATED CONTAINER SEALED WITH GUMMED KRAFT TAPE
CONTAINER PLACED IN WATERPROOF BARRIER, SEALED, AND PLACED IN CRATE SHOWN AT RIGHT.
WOOD CRATE DIVIDED INTO THREE COMPARTMENTS
4. PLACED IN SECOND CORRUGATED FIBERBOARD BOX SEALED WITH GUMMED KRAFT TAPE.
5. BOX WRAPPED WITH WATERPROOF BARRIER MATERIAL SEALED WITH TAPE TO AFFORD SAME PROTECTION AS BODY MATERIAL.
6. PLACED IN CRATE SHOWN AT LEFT.
TM 830-23

Figure 5. Packaging illustration.

13. Installation of Battery-charging Panel for Use with Radio Transmitting Set AN/SRT–1A

a. Install the battery-charging panel on a bulkhead in the location where the transmitting set is to be stowed. The hardware used to fasten the battery-charging panel to the plywood backing in the shipping container (fig. 5) may be used to mount the panel. Locate the charging panel so that the 6-foot lead attached to it will easily reach the CHARGING RECEPTACLE on the front panel of Radio Transmitting Set AN/SRT–1A. Connect the ship's d-c line to the input terminals in the conduit box (fig. 20), being careful to observe the proper polarity. The size of the connecting wire should be at least No. 16 AWG.

b. Assemble a set of three battery cells in their tray (par. 28) and place them in the battery-charging panel (fig. 4). Connect the battery to the binding posts on the charging panel, being careful to observe correct polarity. The left-hand (red) battery lead is positive; the right-hand lead (black) is negative.

c. Stow the hydrometer, spare battery cells (dry), and spare fuses for the charging panel in a convenient location.

14. Shipboard Installation Procedures

Installation of the transmitting equipment aboard ship consists of preparing the transmitter for emergency use in a lifeboat. Preparations for the transmitter include installation of batteries, tubes, and spare equipment, a preventive maintenance check, an operational check, and adjustment of antenna coupling. In addition, the lifeboat rigging must be prepared to accept the transmitting antenna. This preparation may be made just prior to the adjustment of the antenna coupling, since the adjustment requires connection of the transmitter to the actual antenna to be used in the lifeboat. Make all shipboard preparations as outlined in *a* through *g* below.

a. Assemble and test a battery as outlined in paragraph 28. Remove the retaining bar across the battery compartment (fig. 3); slide the entire battery and power supply compartment out of the suitcase (fig. 18); and place the battery case in position. Connect the battery leads under the wingnuts at the left (positive) and the right (negative) of the terminal board on the rear of the panel (fig. 18). Replace the compartment and the retaining bar across the battery.

b. To gain access to the chassis for installation of tubes, remove the seven wood screws around the top and sides of the transmitter

panel. The transmitter chassis may be slid out by carefully pulling on the GROUND TERMINAL and CHARGING RECEPTACLE. Slide the chassis out far enough to allow installation of tubes. Tube clamps may be loosened by inserting a screw driver into the slot of the release latch (fig. 17) and turning the screw driver counterclockwise. After testing the tubes, including a spare tube, insert them in their sockets. Tube layout is shown in figure 17.

c. Perform the preventive maintenance checks outlined in paragraph 27. If defective parts are noted, refer to chapters 3 and 4 for complete maintenance information.

d. Reassemble the equipment and make an operational check as outlined in the equipment performance checklist (par. 24). Connect the artificial antenna capacitor between the ANTENNA TERMINAL and GROUND TERMINAL while making the check. If operation is unsatisfactory, refer to chapters 3 and 4 for complete maintenance information. Check the frequency of the transmitter (item 10 of the checklist) with a calibrated receiver or frequency meter. If the frequency is not 500 kc, aline the oscillator and power amplifier as described in paragraphs 51 through 54.

e. Prepare the lifeboat rigging to accept the transmitting antenna by performing steps 1, 2, and 3 of the instructions in figure 8A. The antenna wire, ground wire, two 11-inch strain insulators, and the 16-inch topmast insulator are to be stored in the lifeboat, ready for emergency use.

f. Make a temporary installation of the antenna-ground system by completing the instructions given in figure 8, and adjust the antenna coupling as instructed in paragraph 55*a* through *d*. The lifeboat antenna system is to be used in place of the artificial antenna capacitor and 10-ohm resistor prescribed for bench adjustments. Dismantle the antenna-ground system when adjustments are complete, but leave the antenna-ground equipment in the lifeboat.

Note. There shall be no transmission of the international distress signal or any other emergency signal while testing or tuning with the actual antenna installed. All rules governing transmission at 500 kc must be observed.

g. Place the spare and accessory equipment in the transmitter case, in the compartments to the left and right of the battery compartment and in the clips on the cover of the suitcase. Lash the 40-foot length of rope to the case of the transmitter. Spare and accessory equipment include the following:

(1) A spare vibrator, to be stored in the compartment at the left of the battery.

(2) A spare ground wire with sinker, to be stored in the compartment at the left of the battery.

(3) Two spare 11-inch strain insulators, to be stored, one each, in the compartments to the left and right of the battery.

(4) An artificial antenna capacitor, to be stored in the compartment at the right of the battery.

(5) A spare antenna wire, to be stored in the compartment at the right of the battery.

(6) A spare topmast insulator, to be stored in the metal clips on the inside of the suitcase cover.

(7) An instruction manual, to be stored, as convenient, within the suitcase.

(8) A spare battery, which is normally kept in the battery-charging panel but which is to be placed in the lifeboat, if time permits, in case of emergency.

(9) A spare tube, which is to be placed in the spare socket on the transmitter chassis, in accordance with instructions in *b* above. Two additional spare tubes are provided; these are to be kept with the transmitter aboard ship. In case of emergency, these additional spares should be placed in the lifeboat if time permits.

(10) Two spare lamps for the TUNING INDICATOR, one shipped installed in clips near the keying mechanism and the other to be stored, as convenient, in one of the compartments next to the battery.

15. Lifeboat Installation of Transmitter

a. GENERAL. The main points to be considered when installing Radio Transmitting Set AN/SRT–1A in a lifeboat are concerned with the antenna-ground system. Since an antenna mast and rigging equipment are not furnished with the transmitter, numerous differences may be encountered in lifeboats of different manufacture. Regardless of the type of lifeboat or mast arrangement, certain fundamental requirements are common.

(1) At its highest point, the antenna should be at least 26 feet above the water line. The mast or masts should be capable of fulfilling this requirement.

(2) Suitable rigging equipment must be available for raising the antenna mast and holding it fast.

(3) On metal lifeboats, at least one large brass stud with washer and wingnut should be available for connection of the transmitter ground lead.

b. LOCATION OF TRANSMITTER. The transmitter may be located at any convenient place in the lifeboat and should be lashed to a thwart by means of the web straps on the case.

c. SPARE EQUIPMENT. *If time permits, the extra battery (from the charging panel) and the spare cells (filled with electrolyte) should be placed in the lifeboat with the transmitter.* The second battery and spare cells can increase the operating period of the transmitter by at least 2 days.

d. ANTENNA-GROUND INSTALLATION. See figure 8 for general instructions on installing the antenna-ground system. It is realized that variations will be encountered on lifeboats of different manufacture; these instructions, therefore, may not apply. In such a case, follow the instructions as closely as possible. On metal lifeboats, do not allow the antenna or antenna lead-in to touch any part of the boat.

16. Services on Receipt of Used or Reconditioned Equipment

a. Follow the instructions in paragraph 12 for uncrating, unpacking, and checking the equipment.

b. Check the used or reconditioned equipment for tags or other indications pertaining to changes in the wiring of the equipment. If any changes in wiring have been made, note the change in this manual, preferably on the schematic diagram.

c. Follow the instructions in paragraphs 13, 14, and 15 for installing the equipment aboard ship and in the lifeboat.

Section II. CONTROLS AND INSTRUMENTS

17. Transmitter Controls and Their Use

(fig. 6)

Note. This section describes, locates, illustrates, and furnishes the operator, crew, or driver sufficient information pertaining to the various controls and instruments provided for the proper operation of the matériel.

The following table lists the controls of the transmitter and indicates what they do:

Control	Function
START SWITCH (S6)----------	When pressed, the START SWITCH energizes the transmitter. Filaments will light and motor will operate for 2 minutes after the switch is pressed.

Control	Function
SIGNAL SWITCH (S5)	In the KEY position, the SIGNAL SWITCH provides for manual keying of transmitter; in the SOS position, it provides for automatic keying of the transmitter.
KEY (K2)	May be used by a radio operator to transmit signals, when the SIGNAL SWITCH is in KEY position.
ANTENNA SELECTOR (S2)	Used with ANTENNA TUNING to obtain maximum brilliance from TUNING INDICATOR lamp; it changes taps on the antenna loading coil.
ANTENNA TUNING (L4)	Controls variometer section of antenna loading coil to tune antenna. Control should be set for maximum brilliance from TUNING INDICATOR lamp.
ANTENNA COUPLING SWITCH (S1).	Changes taps on power amplifier plate tank coil. Switch is a screw-driver adjust type and is reached by removing small plug from front panel. This switch is normally adjusted aboard ship and is set (par. 55) for maximum brilliance of the TUNING INDICATOR lamp.
TUNING INDICATOR (T1)	Gives visual indication of amount of power being applied to the antenna system.

18. Battery-charging Panel Controls and Their Use

(fig. 7)

Control	Function
LINE VOLTAGE (S101)	Changes resistance of charger to operate from 115- or 230-volt line when placed in 115 V or 230 V position, respectively.
LINE SWITCH (S102)	Turns charging panel ON or OFF, as indicated.
CHARGING RATE (S103)	Selects HIGH or LOW charging rate when charger is operated on 115-volt d-c line. Switch is inoperative on 230 volts dc.
CHARGING CURRENT (M101).	Gives visual indication of charging rate.

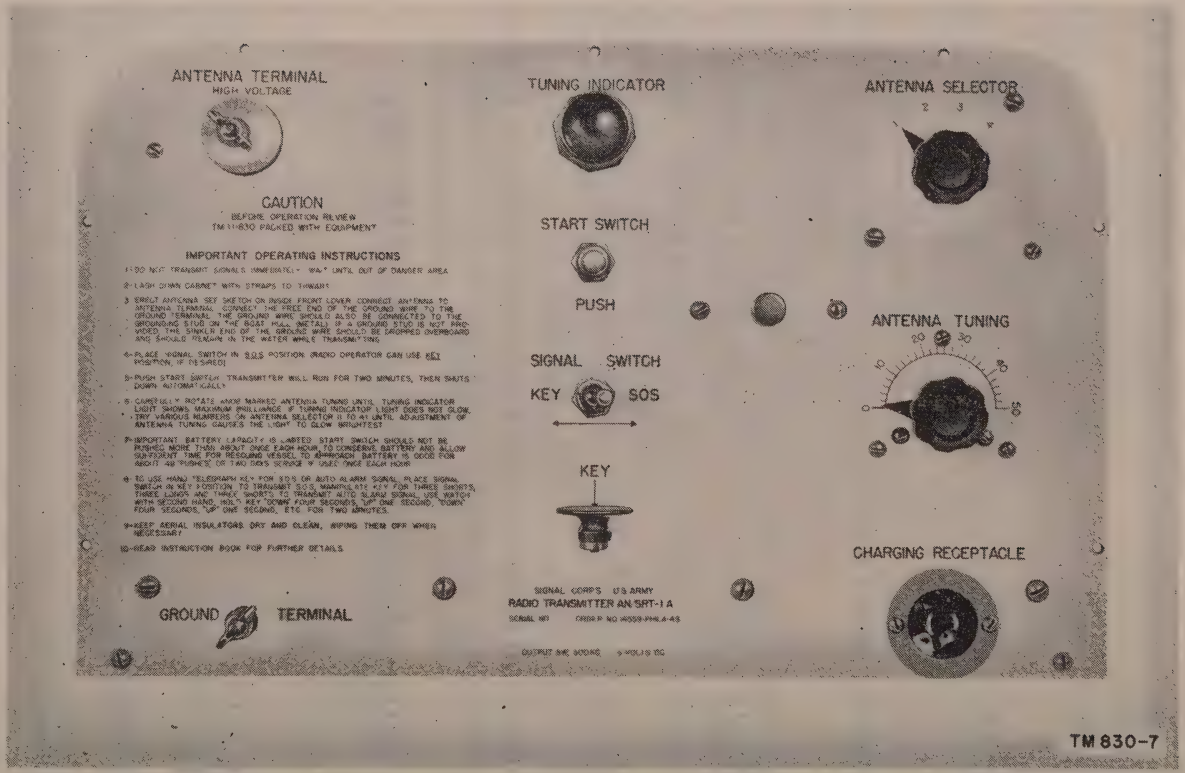

ANTENNA TERMINAL
HIGH VOLTAGE
CAUTION
BEFORE OPERATION REVIEW
TM 11-830 PACKED WITH EQUIPMENT
IMPORTANT OPERATING INSTRUCTIONS
1-DO NOT TRANSMIT SIGNALS IMMEDIATELY WAIT UNTIL OUT OF DANGER AREA
2-LASH DOWN CABINET WITH STRAPS TO THWART
3 ERECT ANTENNA SEE SKETCH ON INSIDE FRONT LOWER CONNECT ANTENNA TO ANTENNA TERMINAL CONNECT THE FREE END OF THE GROUND WIRE TO THE GROUND TERMINAL THE GROUND WIRE SHOULD ALSO BE CONNECTED TO THE GROUNDING STUD ON THE BOAT HULL (METAL) IF A GROUND STUD IS NOT PROVIDED THE SINGLE END OF THE GROUND WIRE SHOULD BE DROPPED OVERBOARD AND SHOULD REMAIN IN THE WATER WHILE TRANSMITTING
4-PLACE SIGNAL SWITCH IN SOS POSITION (RADIO OPERATOR CAN USE KEY POSITION, IF DESIRED)
5-PUSH START SWITCH TRANSMITTER WILL RUN FOR TWO MINUTES, THEN SHUTS DOWN AUTOMATICALLY
6 CAREFULLY ROTATE AND MARKED ANTENNA TUNING UNITS, TUNING INDICATOR LIGHT SHOWS MAXIMUM BRILLIANCE IF TUNING INDICATOR LIGHT DOES NOT GLOW, TRY VARIOUS NUMBERS ON ANTENNA SELECTOR II TO 41 UNTIL ADJUSTMENT OF ANTENNA TUNING CAUSES THE LIGHT TO GLOW BRIGHTEST
7-IMPORTANT BATTERY CAPACITY IS LIMITED START SWITCH SHOULD NOT BE PUSHED MORE THAN ABOUT ONCE EACH HOUR TO CONSERVE BATTERY AND ALLOW SUFFICIENT TIME FOR RESCUING VESSEL TO APPROACH BATTERY IS GOOD FOR ABOUT 48 PUSHES OR TWO DAYS SERVICE IF USED ONCE EACH HOUR
8 TO USE HAND TELEGRAPH KEY FOR SOS OR AUTO ALARM SIGNAL PLACE SIGNAL SWITCH IN KEY POSITION TO TRANSMIT SOS, MANIPULATE KEY FOR THREE SHORTS, THREE LONGS AND THREE SHORTS TO TRANSMIT AUTO ALARM SIGNAL USE WATCH WITH SECOND HAND, HOLD KEY DOWN FOR FOUR SECONDS, UP ONE SECOND, DOWN FOUR SECONDS, UP ONE SECOND, ETC FOR TWO MINUTES
9-KEEP AERIAL INSULATORS DRY AND CLEAN, WIPING THEM OFF WHEN NECESSARY
10-READ INSTRUCTION BOOK FOR FURTHER DETAILS
GROUND TERMINAL
TUNING INDICATOR
START SWITCH
PUSH
SIGNAL SWITCH
KEY
SOS
KEY
SIGNAL CORPS U.S. ARMY
RADIO TRANSMITTER AN/SRT-1A
ANTENNA SELECTOR
ANTENNA TUNING
CHARGING RECEPTACLE
TM 830-7

Figure 6. Radio Transmitting Set AN/SRT–1A, front panel.

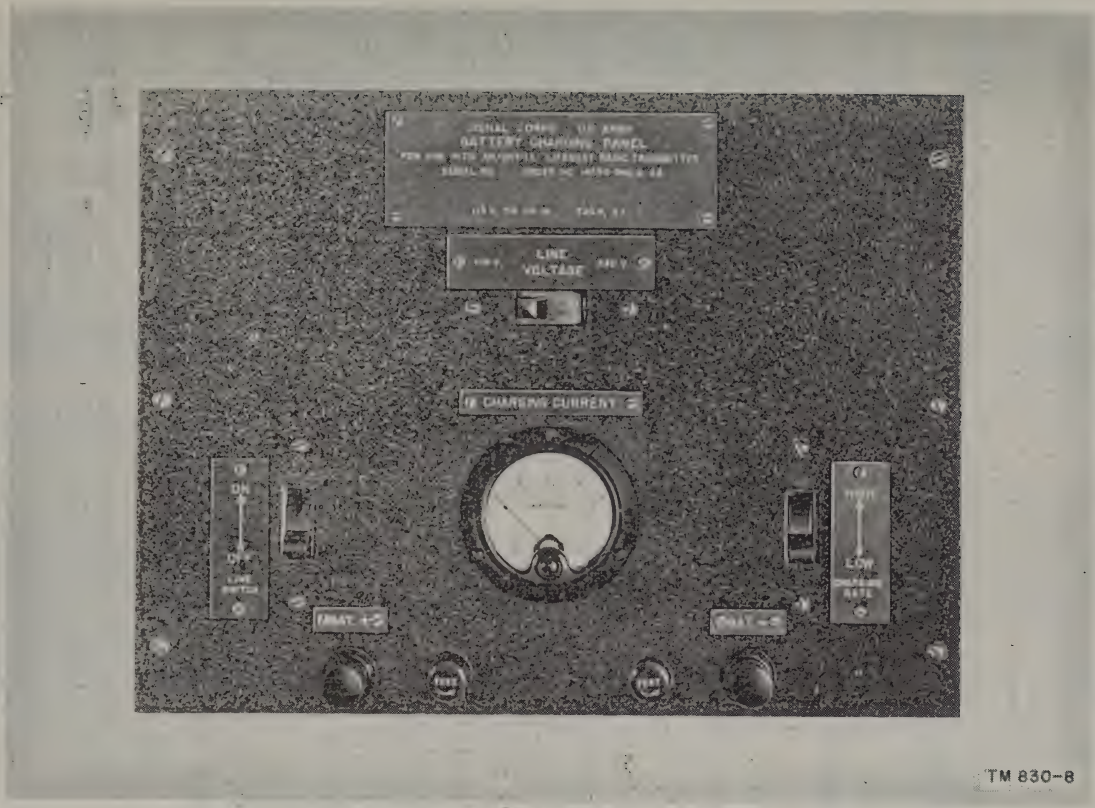


Figure 7. Battery-charging panel, front panel.

Section III. OPERATION UNDER USUAL CONDITIONS

19. Lifeboat Operation

Warning: The transmitter batteries have a limited capacity. Before pressing the START SWITCH, be as certain as possible that the equipment is installed correctly and is ready to transmit the SOS signals. Time taken for careful installation of equipment and for understanding the operation of the equipment will be well spent. It may mean *your* life. To utilize the equipment to best advantage follow all instructions carefully.

a. LOCATION OF TRANSMITTER. The transmitter may be located at any convenient place in the lifeboat and should be lashed to a thwart by means of the web straps on the case.

b. INSTALLATION OF ANTENNA-GROUND SYSTEM. Instructions for the installation of the antenna-ground system are given in figure 8 and are repeated on the inside of the suitcase cover. Inspect the lifeboat rigging to determine whether steps 1, 2, and 3 of the instructions in A of figure 8 have been performed. If the necessary rigging, the antenna wire, and the ground wire have been provided, complete the instructions listed in B and C of figure 8. If the lifeboat has not been equipped with the necessary rigging, the antenna wire, and the ground wire, it will be necessary to prepare some makeshift arrangement which approximates the installation shown in figure 8. Spare antenna and ground wire and spare insulators are stored in the transmitter; the antenna with two 11-inch train insulators to the right of the battery, the ground wire with sinker to the left of the battery, and the 16-inch topmast insulator in clips on the inside of the suitcase cover. Utilize the spare equipment and any equipment in the lifeboat to erect an antenna as high as possible. Follow the general instructions of figure 8. On metal lifeboats do not allow the antenna or antenna lead-in wire to touch any metal portion of the boat.

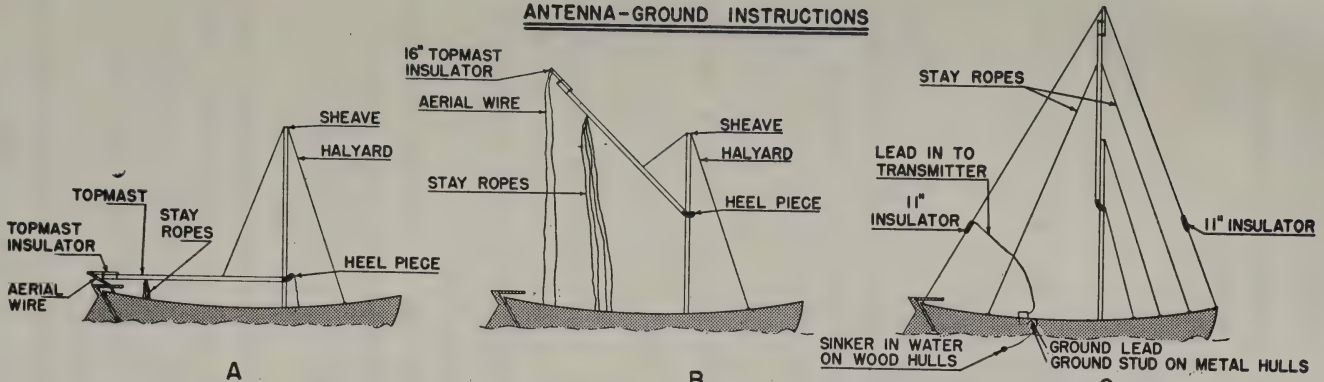
c. PRECAUTIONS.

(1) Keep the transmitter from direct contact with salt spray whenever the front cover is off. Remove the cover only when absolutely necessary for operation.

(2) Keep the aerial wire free and clear from stays, sails, etc.

(3) Do not touch the aerial or any of the metal parts of the transmitter when the transmitter is running. While no electric shock dangerous to life exists, a small burn may result.

ANTENNA-GROUND INSTRUCTIONS



A

1- SAILING MAST SHOULD BE FITTED WITH SHEAVE, OR THIMBLES AND STROP TO TAKE A HALYARD IN ADDITION TO SAIL BLOCK.

2- 16" INSULATOR SHOULD BE PREVIOUSLY LASHED TO TOP OF TOPMAST. AERIAL WIRE SHOULD BE RUN THROUGH HOLE AT TOP OF 16" INSULATOR AND MADE "ALL READY" FOR HOISTING.

3- BOTTOM OF TOPMAST SHOULD BE PREVIOUSLY RIGGED WITH HEEL PIECE TO PROVIDE A SLIDING FIT ON SAILING MAST. FASTEN HOISTING HALYARD AS SHOWN. TOPMAST SHOULD ALSO HAVE FOUR STAY ROPES FITTED AS SHOWN.

B

1- HOIST TOPMAST, HOLDING DOWN HEEL PIECE UNTIL MAST IS VERTICAL.

2- MAKE FAST, HOISTING HALYARD AFTER TOPMAST IS RAISED.

IMPORTANT GENERAL NOTES

KEEP AERIAL INSULATORS CLEAN AND DRY; WIPE THEM OFF WHEN NECESSARY.

IF LIFEBOAT USES A DIFFERENT MAST ARRANGEMENT THAN SHOWN ABOVE, OR IF AN EMERGENCY SUPPORT IS USED, ALWAYS ERECT ANTENNA TO AS GREAT A HEIGHT AS PRACTICABLE.

C

1- MAKE FAST THE FOUR STAY ROPES FOR GUYING TOPMAST.

2- MAKE FAST FORWARD AND AFT ENDS OF AERIAL WIRE WITH 11" INSULATOR AT EACH END AS SHOWN.

3- RUN LEAD-IN FROM AERIAL TO ANTENNA TERMINAL ON TRANSMITTER, LEAVING SUFFICIENT SLACK IN LEAD-IN TO AVOID STRAIN ON TRANSMITTER WHEN AERIAL SWAYS IN WIND.

4- ON WOOD LIFEBOATS, PLACE SINKER END OF GROUND WIRE OVER THE SIDE IN THE WATER, CONNECTING OTHER END TO GROUND TERMINAL ON TRANSMITTER. ON METAL LIFEBOATS, CONNECT SPADE TERMINAL LUG ON GROUND WIRE TO GROUND STUD PROVIDED IN LIFEBOAT. CONNECT OTHER END TO GROUND TERMINAL ON TRANSMITTER.

TM 830-6

Figure 8. Antenna-ground instructions.

d. OPERATION. The IMPORTANT OPERATING INSTRUCTIONS printed on the panel of the transmitter are repeated verbatim in paragraph 20. Before attempting operation, read these instructions completely *and* the general operating notes in paragraph 21. If the operation of the transmitter is understood, the limited life of the battery will not be wasted.

20. Important Operating Instructions

The following instructions appear on the front panel of Radio Transmitting Set AN/SRT–1A:

a. Do not transmit signals immediately. Wait until out of danger area.

b. Lash down cabinet with straps to thwart.

c. Erect antenna. See sketch on inside front cover. Connect antenna to ANTENNA TERMINAL. Connect the free end of the ground wire to the GROUND TERMINAL. The ground wire should also be connected to the grounding stud on the boat hull (metal). If a ground stud is not provided, the sinker end of the ground wire should be dropped overboard and should remain in the water while transmitting.

d. Place SIGNAL SWITCH in SOS position. (Radio operator can use KEY position if desired.)

e. Push START SWITCH. Transmitter will run for two minutes, then shuts down automatically.

f. Carefully rotate knob marked ANTENNA TUNING until TUNING INDICATOR light shows maximum brilliance. If TUNING INDICATOR light does not glow, try various numbers on ANTENNA SELECTOR (*a* to *d*) until adjustment of ANTENNA TUNING causes the light to glow brightest.

g. Important. Battery capacity is limited. START SWITCH should not be pushed more than about once each hour, to conserve battery and allow sufficient time for rescuing vessel to approach. Battery is good for about 48 "pushes," or two days service if used once each hour.

h. To use hand telegraph key for SOS or auto alarm signal, place SIGNAL SWITCH in KEY position. To transmit SOS, manipulate key for three shorts, three longs, and three shorts. To transmit auto alarm signal, use watch with second hand, hold KEY "down" four seconds, "up" one second, "down" four seconds, "up" one second, etc., for two minutes.

i. Keep aerial insulators dry and clean, wiping them off when necessary.

j. Read instruction manual for further details.

21. General Operating Notes

a. Normally an artificial antenna capacitor is stored in the compartment to the left of the battery for testing purposes *aboard ship.* The capacitor *is not to be used* in lifeboat operation of the transmitter. *Do not connect it to the transmitter in any way.* If the capacitor has been left connected to the ANTENNA TERMINAL and GROUND TERMINAL by shipboard personnel, it must be removed before operation is attempted. *The SOS signal will not be transmitted if the capacitor is left connected.*

b. Step 6 of the IMPORTANT OPERATING INSTRUCTIONS is to be performed immediately after the START SWITCH is pressed. The TUNING INDICATOR lamp on the transmitter panel will flash on and off as SOS signals and long dashes are transmitted automatically. The best time to adjust the ANTENNA TUNING and the ANTENNA SELECTOR controls for maximum brilliance of the TUNING INDICATOR is during the long dash, while the light is operating steadily. (When operating in broad daylight, the operator may have to cup his hands over the indicator in order to distinguish variations in brilliance.) If the duration of the long dash is not sufficient for obtaining a maximum indication on the TUNING INDICATOR, an *alternate* method of adjustment is outlined in steps (1) through (3) below. However, do not make repeated haphazard attempts to tune the transmitter if the light does not glow at all. Refer to the emergency trouble-shooting procedures (par. 22) for possible sources of trouble.

Note. The alternate method uses battery power without transmission of the distress signal. Do not prolong the operation.

(1) Place the SIGNAL SWITCH in the KEY position.

(2) Press the START SWITCH; then depress the hand key and adjust the ANTENNA TUNING and ANTENNA SELECTOR switches for maximum brilliance on the TUNING INDICATOR.

(3) Return the SIGNAL SWITCH to the SOS position as soon as the maximum indication has been obtained.

c. For the best chance of contact with a rescue ship, try to operate the transmitter at the same time each hour. When a ship hears the SOS signals the first time, it may not have sufficient time to set its direction finder in operation. An hour later the ship will be watching for the SOS signals. By regular hourly transmission, the ship can keep better track of the lifeboat. This is especially important during the night. If a ship can be seen, push the button more frequently; for example, every 15 minutes.

d. Important. Remember that the battery capacity is limited. The battery is good for about 48 pushes or 2 days of service, if used once each hour.

e. If the radio operator is in the lifeboat, he can use the hand telegraph key by placing the SIGNAL SWITCH in the KEY position. The international Morse code is included in this manual (fig. 9).

f. When the lifeboat is under sail, care must be taken that the radio antenna does not interfere with the sail. Since the transmitter will normally not be used more than about once an hour, the antenna may be temporarily unrigged fore and aft and brought down to the base of the mast so as not to interfere with the sail. Then, when the transmitter is to be used, the antenna may be rigged to its normal position.

22. Emergency Trouble Shooting

a. Sources of Trouble. If the TUNING INDICATOR does not glow, it generally indicates that the SOS signal is not being transmitted. There are various sources of trouble; for example, tube failure, mistuning, power supply failure, which may be detected and remedied by unskilled personnel without tools. Check for these troubles systematically as outlined in *b* and *c* below.

b. Determining Symptoms. The first trouble-shooting step is to determine *all* the symptoms. Although the failure of the TUNING INDICATOR is the only immediate indication, additional symptoms probably will be revealed by an inspection of the inside of the transmitter. Determine the symptoms by performing the following steps.

Note. Each time the START SWITCH is pressed, the batteries are used for 2 minutes. *Do not waste this time.* Before pressing the START SWITCH, know what is to be done. Read *all* of the trouble-shooting information first, since the steps to be taken will depend on the symptom present.

(1) Loosen the seven wood screws at the top and sides of the transmitter panel. A screw driver for this purpose has been fastened with a chain to a stud on the right of the battery compartment (fig. 3). By pulling gently on the CHARGING RECEPTACLE and the GROUND TERMINAL, slide the transmitter chassis out far enough to view the interior of the transmitter.

(2) Press the START SWITCH. Inspect for operation of the motor and the lighting of tube filaments. (The tube in the center of the chassis is a spare tube and is not supposed to light.)

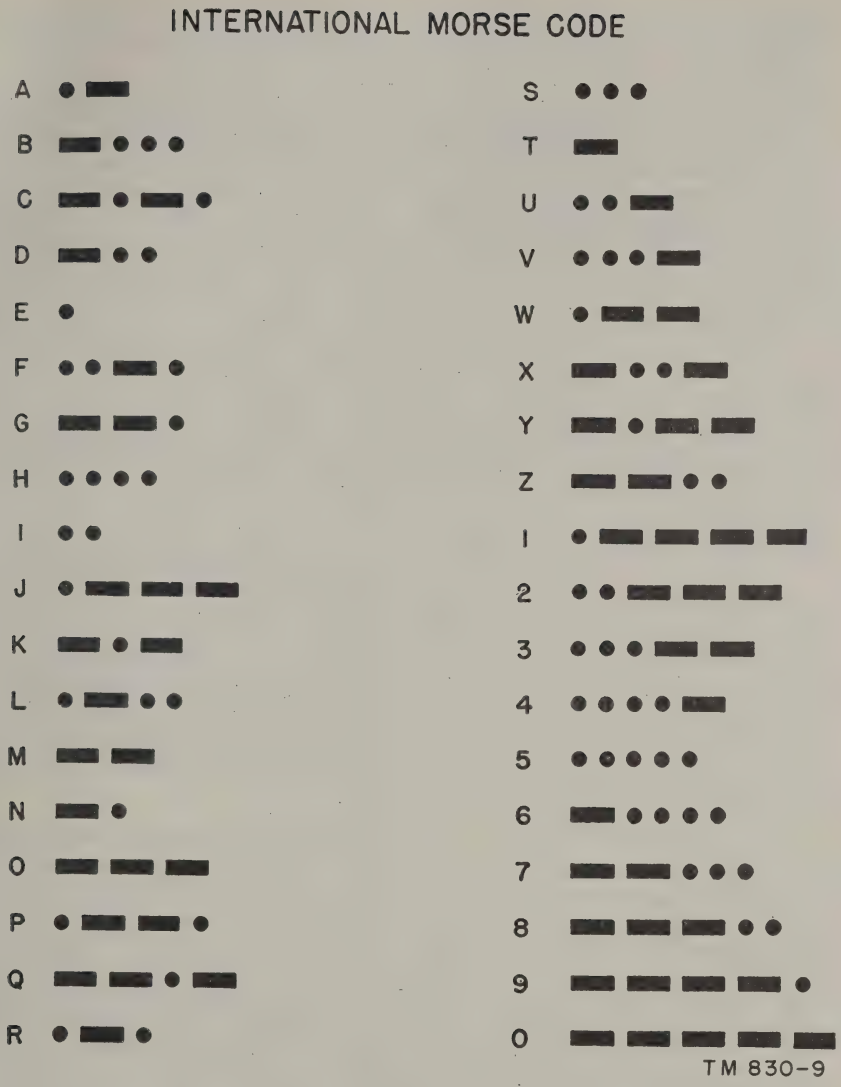


Figure 9. International Morse code.

c. TROUBLE-SHOOTING CHART. The following chart lists three symptoms, one of which will be found when the instructions in step *b*(2) above have been performed. Opposite each symptom is a list of check procedures and corrective measures which apply to that particular symptom. Determine the proper symptom and perform only those check procedures which apply to it. Follow the sequence indicated in the chart. When the TUNING INDICATOR glows, disregard further tests, reassemble the equipment, and operate normally.

Step No.	Symptom	Check procedure and corrective measure
1	Nothing happens when the START SWITCH is pressed; tubes do not light, motor does not operate, and TUNING INDICATOR does not glow.	Check the battery connections. The positive terminal on the middle cell of the battery (fig. 18) should connect to the negative terminal on the left-hand cell; the negative terminal on the middle cell should connect to the positive terminal on the right-hand cell. The positive terminal of the left-hand cell should connect to the binding post marked + on the rear of the panel behind the battery (fig. 18); the negative terminal of the right-hand cell should connect to the binding post marked — on the panel. Two other leads should connect to each of the binding posts. Check the connections to the terminal strip near the vibrator (fig. 18). The terminal board has four terminals designated 1, 2, 3, and 4. Each of these terminals has two leads connecting to it. See figure 24 for a diagrammatic representation of the leads which should connect to the terminal board. See that all these connections are secure. If all connections appear secure, check the battery charge by observing the charge indicators in each of the cells through the openings in the side of the battery case (fig. 3). If the cell is almost completely discharged, only the red ball will float in the electrolyte. (See paragraph 28 for battery maintenance.) If the spare battery has been placed in the lifeboat, replace a discharged battery, being careful to duplicate the original connections. If the individual spare cells are available (*and the spare battery is not*), replace defective cells with the spare cells. If the spare cells are dry, use the electrolyte from the cells which are being replaced. Do not replace single cells if an assembled spare battery is available.

Step No.	Symptom	Check procedure and corrective measure
2	Motor operates, TUNING INDICATOR does not glow, and tube filaments do not light.	Loosen the clamp at the base of each tube (fig. 17) by inserting a screw driver or another thin-bladed instrument in the release slot and turning counterclockwise. Replace *one* of the tubes toward the rear of the chassis with the spare tube. Press the START SWITCH and check for lighting of the filaments. If the filaments light, reassemble the equipment and operate normally. If the filaments do not light, try the spare tube in place of the second regular tube, after first replacing the original tube. If additional spare tubes have been placed in the lifeboat, try every possible combination in an effort to obtain two good tubes simultaneously. *Note.* There must be a tube in *each* of the regular (V1 and V2) sockets when checking. Either both or neither of the tubes will light; one depends upon the other.
3	Motor operates, tubes light, but TUNING INDICATOR does not glow.	Replace the TUNING INDICATOR lamp with the spare lamp located in clips to the left of motor B1 (fig. 17). To gain access to the lamp in the indicator, remove the glass cover of the lamp from the front of panel. Check for an indication on the new lamp by following the normal operating sequence. If the lamp glows, reassemble the equipment and operate normally. Remove the panel plug which is above and to the left of the ANTENNA TUNING control (fig. 6). Insert a screw driver or another thin-bladed instrument through the access hole and rotate antenna coupling switch S1 (fig. 17) to another position. Note the original position so that the switch may be returned to its original position if the following steps yield no result. Recheck the antenna-ground connections to insure that good contact is being made. If it has not already been done, throw the sinker end of the ground lead overboard.

Step No.	Symptom	Check procedure and corrective measure
		Press the START SWITCH and adjust the ANTENNA TUNING and ANTENNA SELECTOR controls for maximum brilliance on the TUNING INDICATOR. Repeat this procedure for each of the six positions of the antenna coupling switch until the lamp glows brightest. Leave the antenna coupling switch at the position which results in maximum brilliance, reassemble the equipment, and operate normally. If the lamp does not glow when any of the above checks are made, return the antenna coupling switch to its original position and replace the vibrator with the spare vibrator normally stored in the compartment at the left of the battery. To gain access to the vibrator, remove the retaining bar across the front of the battery (fig. 3) and slide the entire battery and power supply compartment out from the transmitter (fig. 18). Disconnect the lead running from the top of the vibrator to a stud on the chassis; loosen the clamp at the base of the vibrator and remove the vibrator from its socket. Insert the spare vibrator, tighten the clamp, and connect the lead from the top of the vibrator to the ground stud. Again check for an indication on the TUNING INDICATOR. If the new vibrator yields no results, check the chassis for broken wire, disconnected wire, and loosely connected wire. Check particularly, connections to 2 and 3 on the terminal board near the vibrator on the rear of the panel behind the battery (fig. 18), wiring to tube sockets, wiring to tube caps, the wire which runs from pin 4 of V1 (fig. 19) up through a hole in the chassis to a screw on the interrupter cam (figs. 10 and 17), and the wire which connects between pin 4 of V1 and pin 4 of V2 (fig. 19). Check wiring, as much as possible, against the diagrams and photographs in this manual. If equipment still does not operate, see note at end of this chart.

Note. If none of the above checks yields results, utilize the information in chapters 3 and 4 in an effort to get the equipment operating.

23. Shipboard Operation

When the ship is at sea, operation consists of keeping the batteries fully charged and maintaining the equipment in condition for immediate use. See chapter 3 for shipboard maintenance information. When the ship is in port, frequency and operational checks of the transmitter should be made with the artificial antenna capacitor functioning as an antenna (par. 24).

24. Equipment Performance Checklist

a. PURPOSE. The equipment performance checklist will help the operator to determine whether the transmitter is functioning properly. Its main usage will be limited to shipboard checks of the transmitter to insure readiness of the transmitter for emergency use. The list gives the item to be checked, the conditions under which the item is checked, the normal indications and tolerances of correct operation, and the corrective measures the operator can take. It is realized that circumstances will modify the amount of checking that can be done. If the checks are made aboard ship, a complete test can be made by using the artificial antenna capacitor to see whether the set is operating properly. These checks should be made when the ship is in the harbor so that the transmitter will be ready for immediate use when the ship is at sea.

b. USE OF CHECKLIST. The use of the checklist will be facilitated by an understanding of the column headings, which are enumerated below.

(1) *Action or condition.* For some items, the information given in the action or condition column consists of the settings of various switches and controls under which the item is to be checked. For other items it represents an action that must be taken to check the normal indication given in the normal indication column.

(2) *Normal indication.* The normal indications listed include the visible and audible signs that the operator should perceive when he checks the items. If the indications are not normal, the operator should apply the recommended corrective measures.

(3) *Corrective measures.* The corrective measures listed are those the operator can make. When the measures are not effective in correcting the trouble, trouble shooting by an experienced repairman is necessary.

Note. Some emergency trouble-shooting procedures are included in paragraph 22.

c. CHECKLIST.

Item No.	Item	Action or condition	Normal indication	Corrective measures
1	Antenna	Lead-in wire connected for actual operation, or one terminal of the artificial antenna capacitor connected for test purposes. *Do not leave the capacitor connected during actual operation.*		
2	Ground	Ground wire connected for actual operation, or other terminal on the artificial antenna capacitor connected for test purposes.		
3	Battery	Connections tight and proper polarity observed.		
4	Vibrator	Vibrator connected and plugged in properly.		
5	TUNING INDICATOR lamp.	Plugged into the proper receptacle.		
6	SIGNAL SWITCH	Set to SOS position.		
7	START SWITCH	Press and hold for a few seconds.	Keyer unit motor will start running.	Check battery and vibrator power supply connections.

8	ANTENNA TUNING	Rotate until TUNING INDICATOR lamp glows.	Lamp will glow on and off as transmitter is keyed automatically.	Try different positions on ANTENNA SELECTOR until lamp glows. Adjust antenna coupling by removing plug on panel and adjusting switch with screw driver for maximum TUNING INDICATOR brilliance.
9	TUNING INDICATOR		Glows on and off as keyer unit operates.	Adjust ANTENNA TUNING knob. Adjust ANTENNA SELECTOR switch. Adjust antenna coupling switch. Check battery for low output. Check vibrator for operation. Check tubes.
10	Frequency	Check frequency of transmitter with calibrated receiver or frequency meter. (It will be easier to make this check if the interrupter cam is shorted to ground.)	Loud aural indication on receiver, or zero beat indication on frequency meter, when tuned to 500 kc.	Aline transmitter (pars. 51 through 55).
11	Power output	Connect a 10-ohm, 10-watt, noninductive resistor and a 0- to 1-ampere r-f (radio-frequency) meter between the artificial antenna capacitor and ground.	A reading of at least .75 ampere on the meter when batteries are fully charged.	Check battery, tubes, and tuning.

CHAPTER 3
ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. PREVENTIVE MAINTENANCE SERVICES

25. Definition and Importance of Preventive Maintenance

Preventive maintenance is work performed on equipment (usually when the equipment is not in use) to keep it in such good working order that break-downs and needless interruptions in service will be kept to a minimum. Preventive maintenance differs from trouble shooting and repair since its object is to eliminate certain troubles before they can occur. Since Radio Transmitting Set AN/SRT–1A is an emergency unit upon which many lives may depend, preventive maintenance is extremely important and should be performed periodically aboard ship.

Note. Operations described in this section are organizational maintenance.

26. Preventive Maintenance Checklist

The checklist which follows (par. 27) shows the operator how to maintain the equipment so that trouble shooting and repair will be reduced to a minimum. The checklist is, for the most part, self-explanatory, and the operations and techniques do not require lengthy explanations.

Note. Gasoline will *not* be used as a cleaning fluid for any purpose.

27. Preventive Maintenance Checklist for Radio Transmitting Set AN/SRT–1A

a. BATTERIES. The charge of both the battery in the transmitter and the spare battery in the charging panel should be checked with a hydrometer at least once each week (par. 28).

b. OPERATIONAL CHECK. The operation of the transmitter should be checked whenever the transmitter is in port but not more often than every 2 weeks. To make the check, perform the operations listed in the equipment performance checklist (par. 24); use the artificial antenna capacitor in place of an actual antenna.

c. EXTERIOR AND INTERIOR OF EQUIPMENT. Whenever the ship is in port, but not more often than once each month, the exterior and interior of the equipment should be checked as follows:

(1) Check suitcase for breaks in covering or rubber gasket and for bent hardware.
(2) Check for effects of acid fumes on interior of cabinet and transmitter.
(3) Check wiring for loose connections and frayed insulation.
(4) Check and tighten mechanical parts which may be loose.
(5) Check power resistors for cracks in ceramic.

28. Battery Maintenance

The storage battery used in Radio Transmitting Set AN/SRT–1A is constructed of three separate replaceable cells. (Eight cells are supplied with the equipment.) Each cell is a 2-volt, lead-acid, high-discharge type, with a full-charge specific gravity of 1.280 ±.005. Three cells are to be assembled for use in the transmitter, three are to be assembled as a spare battery (normally kept in the battery-charging panel), and two are to be kept as spares.

a. CONSTRUCTION OF BATTERIES. To assemble a battery for use, remove the retaining bar across the top of the battery case and place three of the cells in the case. Remove the filler caps at the top of the cells, and add electrolyte to a level approximately one-half inch above the cell plates. Replace the filler caps, screwing them fingertight, and wipe the cell tops dry. Replace the retaining bar across the top of the battery case. Connect the three cells in series (positive to negative) with two of the white battery leads supplied. Connect two more battery leads to the output terminals of the battery, white with red tracer to positive terminal and white with black tracer to negative terminal. The battery is then ready for installation in either the transmitter or charging panel.

b. CHECKING BATTERY CHARGE. The importance of maintaining the storage batteries in first class condition at all times cannot be overemphasized. The entire transmitter is useless with a discharged battery, and more than ordinary care should, therefore, be given to maintaining the batteries. The battery charge and condition of electrolyte should be checked regularly, at least once a week.

(1) Each of the cells has a built-in charge indicator of the floating ball type. Depending on the amount of charge, a green, white, and/or red ball will float in the electrolyte to indicate the approximate battery condition. The approximate charges which are indicated by the different colored balls are listed in the following chart:

Indication	Battery condition
Green, white and red balls float on surface of electrolyte.	Fully charged
Green ball begins to sink (floats just beneath surface of electrolyte).	90% charged
White ball begins to sink (floats just beneath surface of electrolyte).	50% charged
Red ball begins to sink (floats just beneath surface of electrolyte).	10% charged

(2) To check the specific gravity of the cells, use the hydrometer supplied. Full charge specific gravity is from 1.280 to 1.300. Recharge the batteries as outlined in *c* through *e* below if the specific gravity is less than 1.260.

(3) The electrolyte level should be approximately one-half inch above the top of the cell plates. Add *distilled* water when necessary, taking care not to use excessive amounts, to maintain this level. Keep the filler caps fingertight at all times, except when adding distilled water or checking specific gravity. Because of capillary action and normal gassing of the battery, small amounts of electrolyte may be forced through the filler cap vent holes. Wipe the cell tops dry and clean each time the battery is inspected.

c. Charging Transmitter Batteries.

(1) Remove the transmitter cover.

(2) Connect the charging panel to the CHARGING RECEPTACLE on the transmitter by means of the 6-foot lead and polarized plug on the charging panel.

(3) Place the LINE VOLTAGE switch of the charging panel in the 115 V or 230 V position, depending on the ship's d-c line voltage.

(4) Place the CHARGING RATE switch of the charging panel in the LOW position. This permits a charging rate of .5 ampere for either position of the LINE VOLTAGE switch. If the ship's supply is 115 volts dc, the HIGH position of the CHARGING RATE switch affords a 1-ampere charging rate. Use the high rate only on a completely discharged battery or when time does not permit use of the low rate.

Note. When the LINE VOLTAGE switch is in the 230 V position, the CHARGING RATE switch has no effect on the charging rate.

(5) Place the LINE SWITCH of the charging panel in the ON position.

(6) Note the CHARGING CURRENT meter reading. It should read approximately .5 ampere or 1.0 ampere depending on the setting of the CHARGING RATE switch and the LINE VOLTAGE switch. As the charge on the batteries comes up, this value may drop off a little. When the colored balls of the battery charge indicator indicate the battery is charged, use the hydrometer to check the actual specific gravity. A reading of 1.280 is sufficient. Do not charge the batteries so long that the electrolyte starts to *boil* off.

d. CHARGING SPARE BATTERY. With the extra battery in the charging panel and connected to the binding posts on the panel (par. 13*b*), perform steps (3) through (6) of *c* above.

e. CHARGING TRANSMITTER AND SPARE BATTERY SIMULTANEOUSLY. If desired, both the battery in the suitcase and the extra battery may be charged in parallel. Under this condition each battery would then be charged at one-half of the rate that would normally be available if only one battery were in the circuit.

f. CHARGING SPARE CELLS. The spare cells provided with this equipment should remain dry-charged until needed to replace a bad cell in one of the battery cases. If it should become necessary to use one or more of the spare cells, fill the cell with electrolyte to the required level (*b* above) and note specific gravity or position of the charge indicators. Replace the defective cell with the new cell and charge the battery at the low rate (*c*(3) through (6) above) for several hours. Watch for excessive gassing and loss of fluid. Add distilled water to the cells when necessary. Discard the defective cell immediately to prevent its being mistaken for a good cell.

Section II. LUBRICATION AND WEATHERPROOFING

29. Lubrication

The moving parts in the keyer unit that require lubrication have been lubricated by the manufacturer and should require no further attention. However, in extreme cases, because of climatic conditions, etc., a small amount of light grease may be applied to the face of the glass and the end bearings of the shafts.

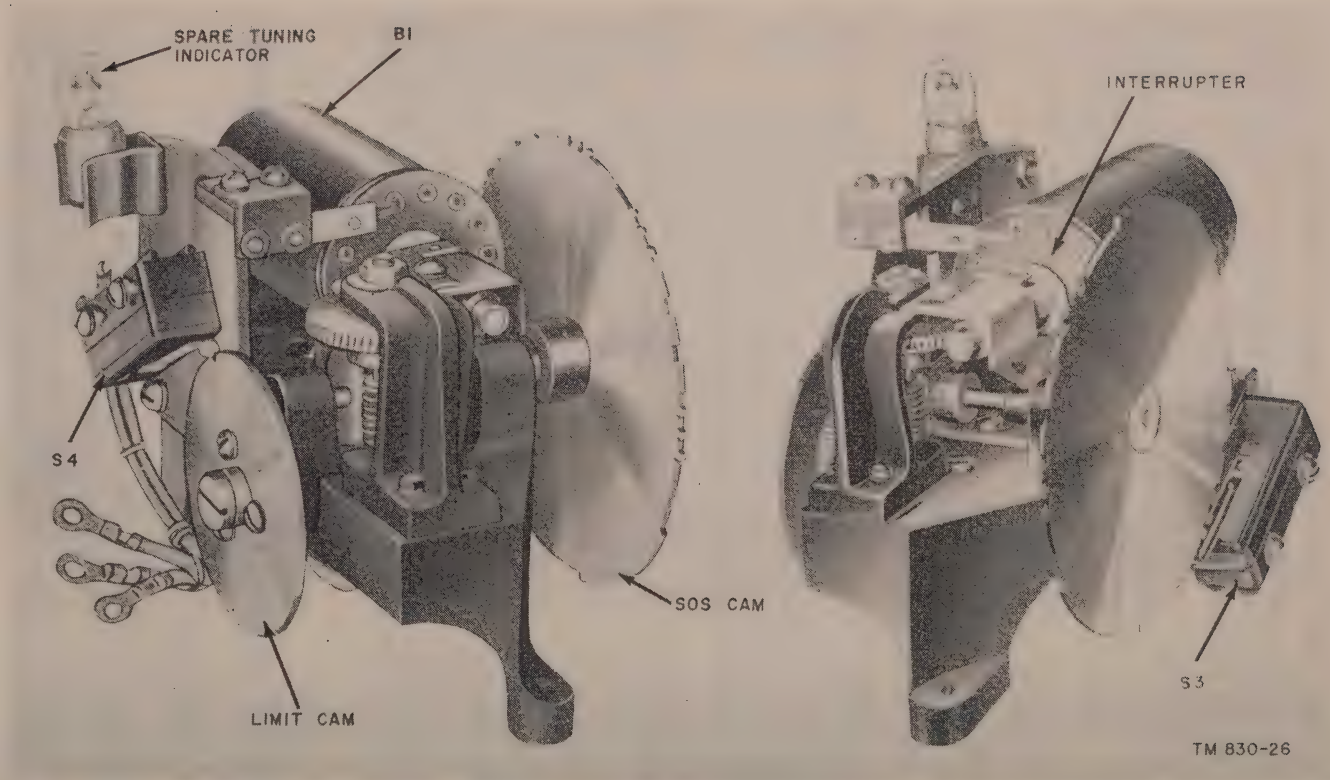


Figure 10. Keyer unit, top views.

30. Weatherproofing

a. GENERAL. Signal Corps equipment, when operated under severe climatic conditions such as prevail in tropical and arctic regions, requires special treatment and maintenance. Fungus growth, insects, dust, corrosion, salt spray, excessive moisture, and extreme temperatures are harmful to most materials.

b. TROPICAL MAINTENANCE MEASURES. Radio Transmitting Set AN/SRT–1A has been tropicalized by the manufacturer. If further moistureproofing or fungiproofing is required, refer to TB SIG 13.

CHAPTER 4
THEORY OF RADIO TRANSMITTING SET AN/SRT–1A

31. Block Diagram
(fig. 11)

Radio Transmitting Set AN/SRT–1A consists of an oscillator, an amplifier, a vibrator power supply, a battery, and a keyer unit. The oscillator stage (V1) generates a 500-kc signal which is amplified by the power amplifier stage (V2) and is fed to the antenna through a tuning and coupling network. Operating voltages are supplied periodically to the oscillator and power amplifier from a 6-volt battery and vibrator power supply through the medium of the keyer unit. Power is supplied only during transmission periods. In addition to keying the power supply, the keyer unit provides for 840-cycle amplitude modulation of the 500-kc signal. Refer to figure 24 for complete circuit details.

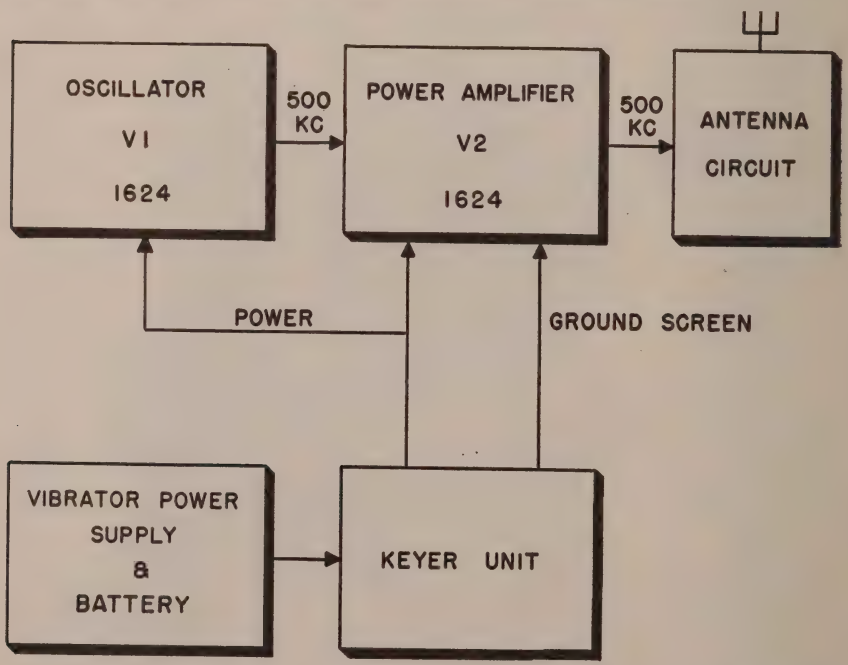


Figure 11. Radio Transmitting Set AN/SRT–1A, block diagram.

32. Oscillator Stage V1

(fig. 12)

a. Oscillator stage V1 utilizes a beam power type 1624 tube in a Hartley oscillator circuit. The oscillator tank circuit, consisting of variable inductance L1 and capacitor C1, is coupled to the plate of V1 through parasitic suppressor R2. Blocking capacitor C2, grid leak resistor R4, and parasitic suppressor R1 couple the tank to the grid of V1.

b. Plate voltage (approximately 500 volts) is supplied by the vibrator power supply when appropriate control circuits have been operated (par. 37). At the same time, screen voltage (approximately 135 volts) is supplied through dropping resistor R3. Capacitor C3 bypasses the screen, and capacitor C4 places the B+ lead to plate coil L1 at r-f ground. Filament voltage is supplied in series with the power amplifier filament through adjustable resistor R8. Resistor R8 is adjusted at the factory and its setting should be changed only if filament voltage is not 2.7 volts. Grid leak bias is developed across resistor R4.

c. When the transmitter is keyed, either automatically or manually (par. 37*b*), the oscillator develops a 500-kc output which is amplitude-modulated at 840 cycles per second. The modulation is obtained by periodically opening and grounding the oscillator grid return by means of an interrupter or chopper disk on the keyer unit. Output from the oscillator is coupled to the power amplifier stage, V2, through capacitor C5 and grid resistor R5. The ground return of R5 is also opened and closed periodically by the interrupter disk.

d. The frequency of the oscillator may be adjusted by means of inductance L1 which is located in the left-hand rear section of the chassis (fig. 17). The movable iron core of the inductance is attached to a threaded shaft which may be adjusted by qualified personnel (par. 53).

33. Power Amplifier Stage V2

(fig. 13)

a. Power amplifier stage V2 utilizes a beam power type 1624 tube in a conventional circuit. The power amplifier tank circuit, consisting of variable inductance L3 and capacitor C8, is coupled to the plate of V2 through parasitic suppressor R6 and capacitor C7. Capacitor C7 serves to isolate the power amplifier tank circuit from the power supply while passing the 500-kc output to the tank. Choke L2 serves to keep the 500-kc signal out of the power supply.

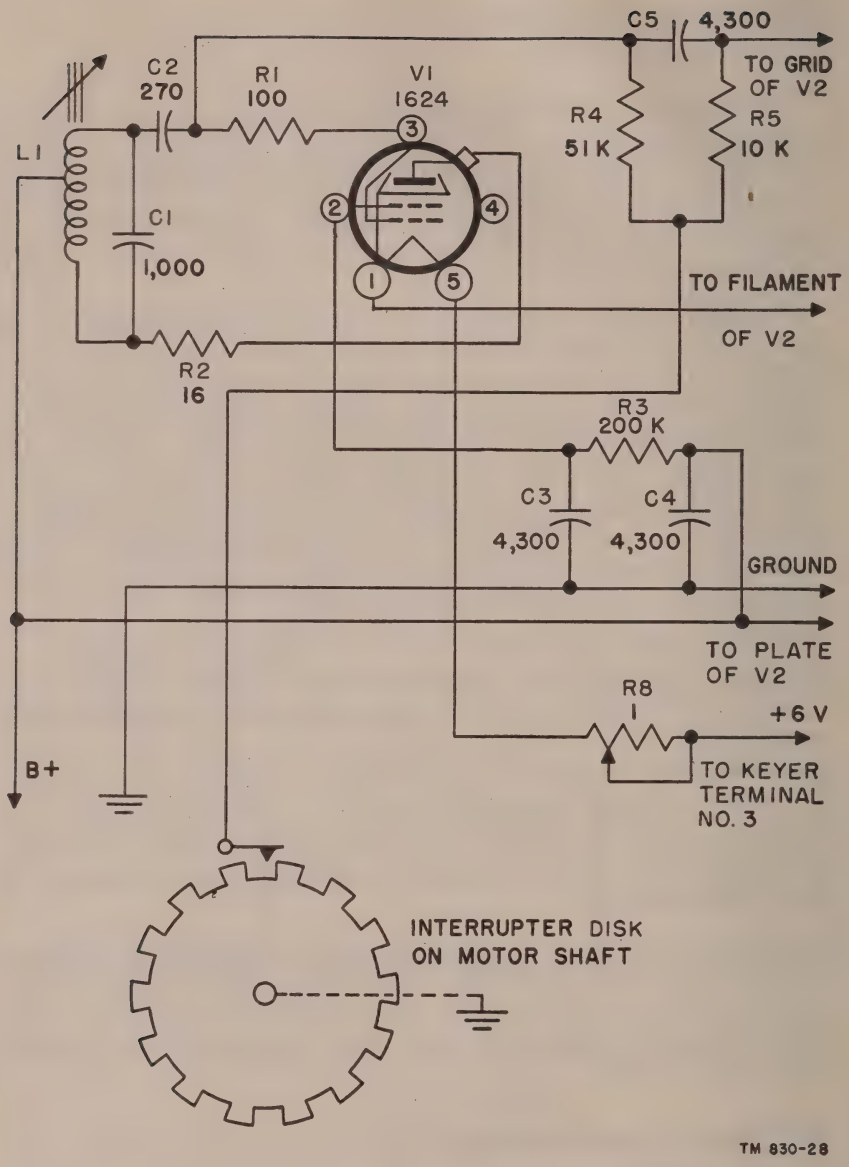


Figure 12. Oscillator stage V1, schematic diagram.

b. Plate voltage (approximately 500 volts) is supplied by the vibrator power supply when appropriate control circuits have been operated. At the same time, screen voltage (approximately 280 volts) is supplied through dropping resistor R7. (Relay K1 is energized at this time.) Capacitor C6 serves to bypass the screen.

Filament voltage is supplied in series with the oscillator filament through adjustable resistor R8. Grid leak bias is developed across resistor R5.

c. When the keyer unit operates (par. 37*b*), the power amplifier amplifies the 500-kc output of the oscillator during the time the KEY is closed or when SOS switch S3 is closed. At other times, the contact on keying relay K1 is closed, grounding the screen and cutting off the output of V2. The power amplifier tank is connected to the antenna tuning system through the antenna coupling switch S1, which is initially adjusted (par. 55) to provide maximum power transfer from the power amplifier tank to the antenna system.

d. The power amplifier tank may be tuned to the frequency of the oscillator by adjustment of a movable iron core in inductor L3, which is located directly behind the antenna coupling switch (fig. 17). The movable iron core of the inductance is attached to a threaded shaft which may be adjusted by qualified personnel (par. 54).

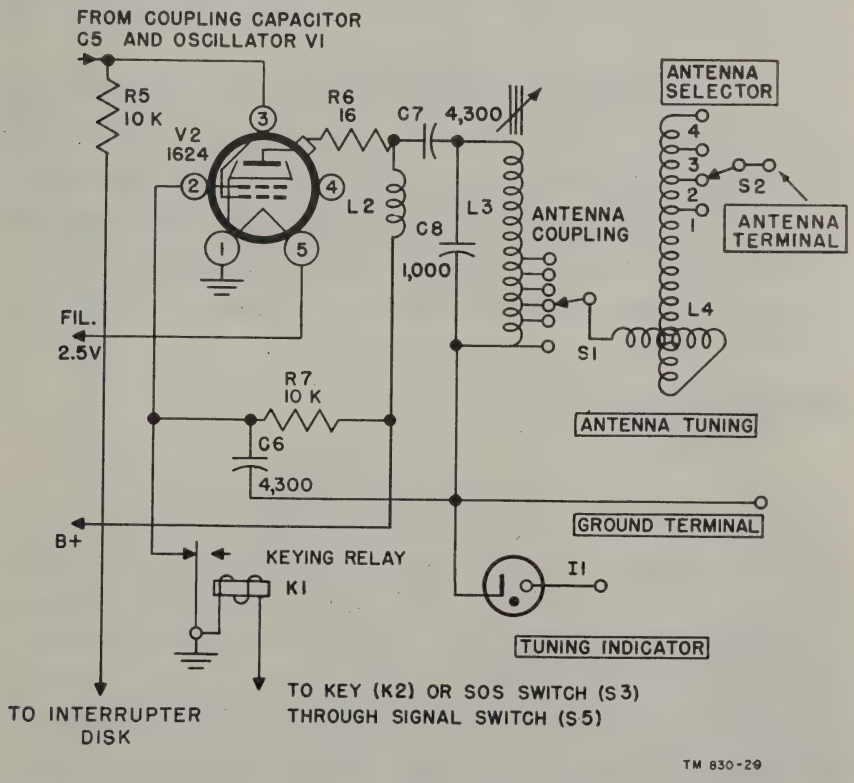


Figure 13. Power amplifier stage V2 and antenna circuit, schematic diagram.

34. Antenna Circuit

(fig. 13)

The antenna circuit comprises an antenna loading inductor-variometer unit. The power amplifier tank is connected to the inductor-variometer through antenna coupling switch S1, which is adjusted for maximum power transfer. ANTENNA SELECTOR switch S2 may be adjusted to compensate for differences in antenna length. When the proper setting of S2 is found, the variometer portion of the antenna loading inductor is adjusted by rotating the ANTENNA TUNING dial until the antenna circuit is properly tuned as indicated by maximum glow from the TUNING INDICATOR lamp.

35. Battery and Power Supply

(fig. 14)

a. The output of the 6-volt battery is supplied to the filaments of V1 and V2 through potentiometer R8 as soon as the START SWITCH is pressed. R8 is adjusted to supply 2.7 volts to the filaments.

b. When the equipment is keyed (par. 37*b*), the 6-volt potential supplied to the vibrator, E1, is interrupted by the vibrator reed, and the resulting pulses of current are fed through the primary of the transformer in the vibrator power supply. The transformer steps up the voltage to a high value. The voltage is then rectified by the second section of the vibrator and filtered by capacitor C11. Capacitor C10 across the secondary of the transformer acts as a transient filter and helps to eliminate or minimize arcing at the vibrator contacts.

36. Keyer Unit

(fig. 15)

a. The keyer unit consists of a 6-volt motor, two cam-operated microswitches, (S3 and S4), and an interrupter or chopper disk. The motor operates at approximately 3,600 rpm (revolutions per minute), drives the interrupter disk directly, drives the SOS cam at approximately 3 rpm, and drives the limit cam at approximately 1 revolution every 2 minutes.

b. The limit cam closes limit switch S4 a few seconds after the motor is energized and holds the switch closed for 1 complete revolution, 2 minutes. The switch contacts parallel the contacts of the START SWITCH (fig. 16).

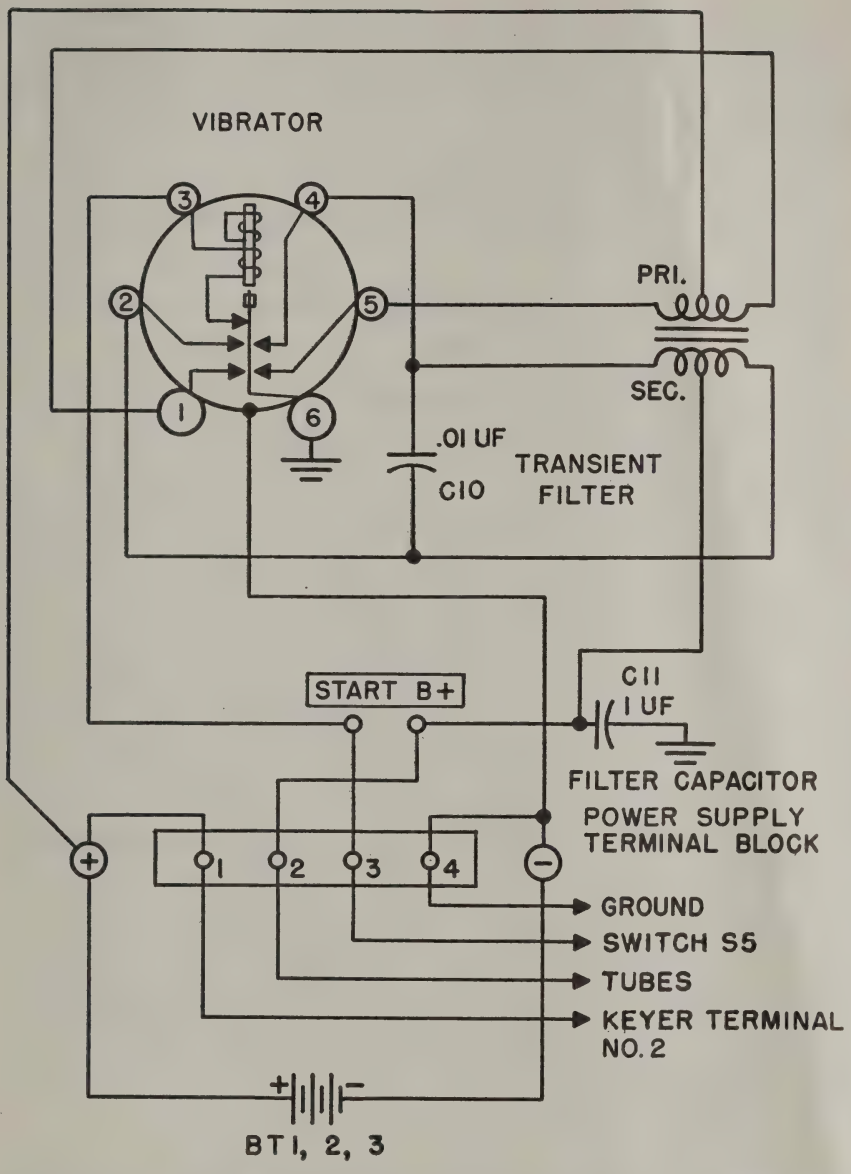


Figure 14. Power supply, schematic diagram.

c. The SOS cam is notched to open and close switch S3 in an SOS dot-dash sequence; the SOS sequence is repeated three times on the periphery of the cam and is followed by a long dash (2.6 seconds) and a silent period (2.75 seconds). Since the cam is rotated at 3 rpm, the SOS sequence is transmitted 18 times while the limit switch is closed.

d. The interrupter or chopper disk makes and breaks the grid return circuits of the oscillator and power amplifier approximately 840 times per second, resulting in 840-cycle modulation of the transmitted signal.

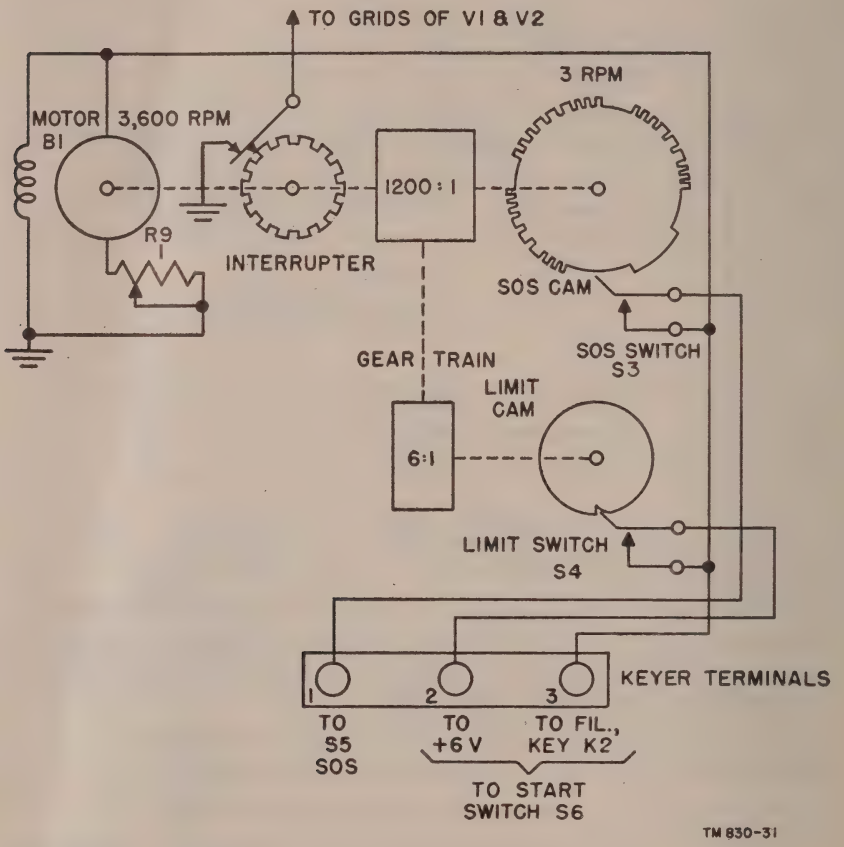


Figure 15. Keyer unit, schematic diagram.

37. Control Circuit

(fig. 16)

a. When the START SWITCH (S6) is pressed, power is applied to the filaments of V1 and V2 through adjustable resistor R8 and to the motor of the keyer unit through adjustable resistor R9. The motor starts turning, driving the interrupter disk directly and driving a gear train which operates the SOS and limit cams. The limit cam closes limit switch S4 and, since the limit switch and the START SWITCH are wired in parallel, the START SWITCH may be released. Resistor R9 may be adjusted to change the motor speed slightly (par. 50) if required.

b. The SOS cam operates SOS switch S3. If SIGNAL SWITCH S5 is in the SOS position, a 6-volt circuit is completed to the vibrator driving coil and to keying relay K1 through limit switch S4 and SOS switch S3. Contacts of relay K1 operate to remove the ground from the screen of the power amplifier stage (V2). If SIGNAL SWITCH S5 is in the KEY position, hand key K2 replaces the SOS switch, and operation of the hand key will complete the 6-volt circuit to the vibrator unit and the keying relay.

38. Theory of Battery-charging Panel

(fig. 25)

The battery-charging panel supplied with Radio Transmitting Set AN/SRT–1A is a resistance type charger for operation from a 115-volt or 230-volt d-c line. The main components of the charging panel are two large ceramic resistors (R101 and R102) which are used to limit current flow through the batteries to a safe value. When the charger is operated from a 115-volt line (S101 in the 115 V position), switch S103 allows connection of R102 alone for a low charging rate, or connection of R101 and R102 in parallel for a high charging rate. When the charger is operated from a 230-volt line, switch S101 is placed in the 230 V position and connects R101 and R102 in series for a single charging rate; S103 has no effect on the circuit. The battery charging plug and the battery terminals (BAT. + and BAT. —) on the charger parallel each other and are in series with the current limiting resistors and CHARGING CURRENT meter, M101. Meter M101 indicates the charging current which flows through the battery (or batteries) connected to the battery charging plug and/or the battery terminals. Two 3-ampere fuses (F101 and F102) are used for protection; one in each side of the input line. Switch S102 is used to connect the charging circuit to a power line. The power line should be connected to the input terminals in the conduit box shown in figure 20.

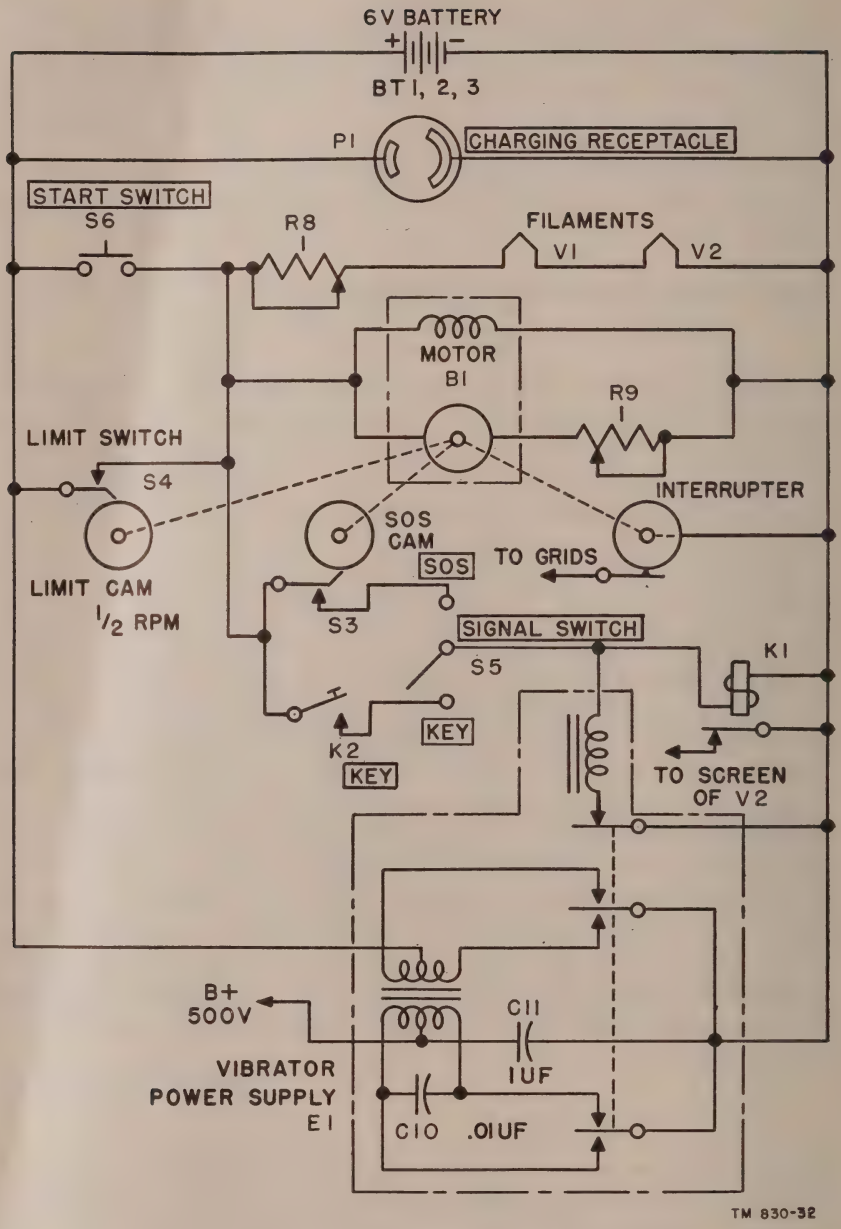


Figure 16. Control circuits.

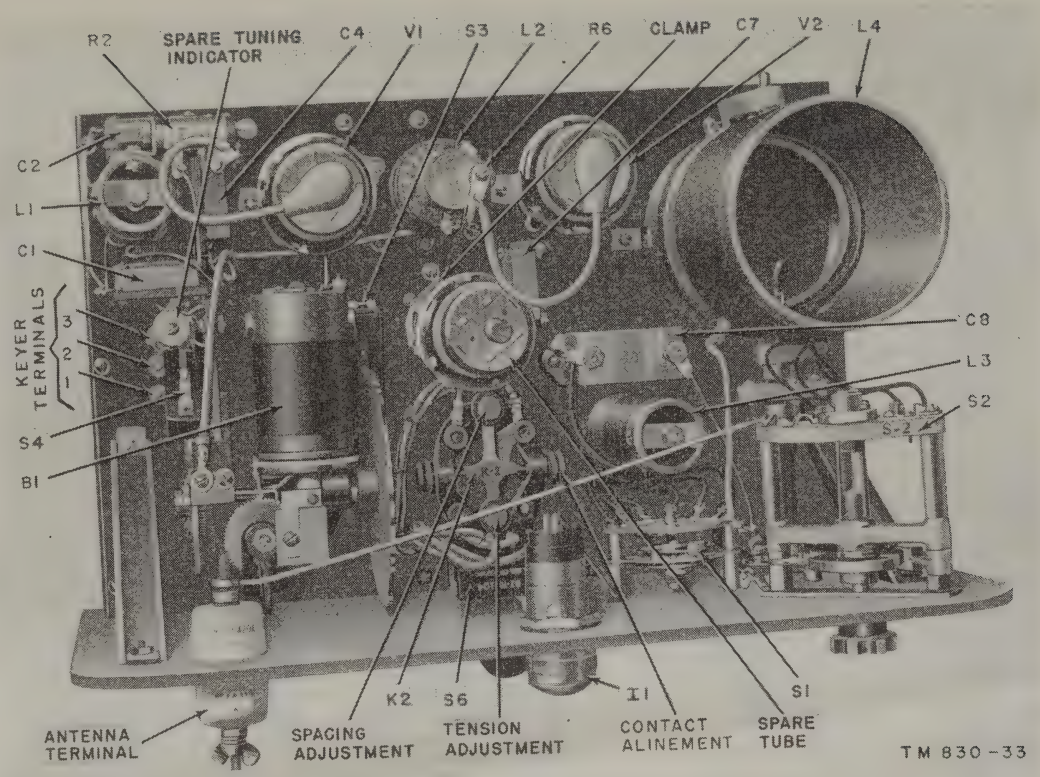


Figure 17. Radio Transmitting Set AN/SRT–1A, top view.

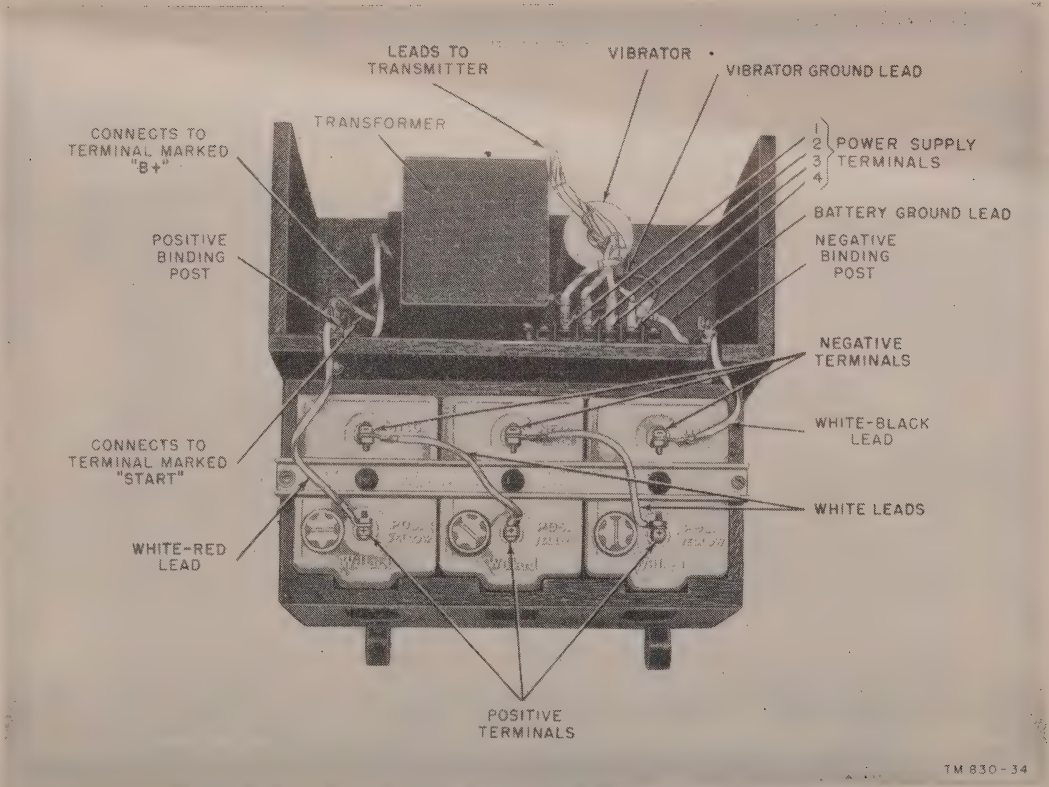


Figure 18. Battery and power supply compartment, top view.

CHAPTER 5
FIELD MAINTENANCE INSTRUCTIONS

Section I. TROUBLE SHOOTING AT FIELD MAINTENANCE LEVEL

Note. This chapter contains information for field maintenance. The amount of repair that can be performed by units having field maintenance responsibility is limited only by the tools and test equipment available and by the skill of the operator.

Warning: When servicing the radio transmitter, be extremely careful because of the high voltages exposed.

39. Trouble-shooting Procedures

a. SECTIONALIZATION. The first step in servicing a defective Radio Transmitting Set AN/SRT–1A is to sectionalize the fault. Sectionalization means tracing the fault to the *major component or circuit* responsible for the abnormal operation of the set, such as the power supply, the oscillator, etc. Careful observation of the radio transmitter while the various controls are being operated may sectionalize the fault to a particular stage or circuit. Paragraph 24, equipment performance checklist, shows normal operating indications. The TUNING INDICATOR lamp will indicate when power is being fed to the antenna circuit. Refer to paragraph 34.

b. LOCALIZATION. The second servicing step is to localize the fault. Localization means tracing the fault to the defective *part* responsible for the abnormal conditions. Some faults such as burned-out resistors, r-f arcing, and shorted transformers can often be localized by sight, smell, and hearing. The majority of faults, however, must be localized by *checking voltage and resistance.* (Refer to pars. 46 and 47.)

c. TESTS. The tests listed below aid in isolating the source of trouble. To be effective, the procedure should be followed in the order given. Remember that servicing procedure should cause no further damage to the equipment. First the trouble should be localized to a single stage or circuit. Then the trouble may be isolated within that stage or circuit by appropriate voltage, re-

sistance, and continuity measurements. The service procedure is summarized as follows:

(1) *Visual inspection.* The purpose of visual inspection (par. 43) is to locate any visible trouble. Through this inspection alone, the repairman frequently may discover the trouble, or determine the stage in which the trouble exists. This inspection is valuable in avoiding additional damage to the transmitter (which might occur through improper servicing methods) and in forestalling future failures.

(2) *Power supply test.* The power supply tests (par. 44) prevent further damage to the transmitter from certain possible short circuits. Since this test gives an indication of the operation of the power supply and filter circuit, its function is more than preventive.

(3) *Operational test.* The operational test (par. 45) is important because it frequently indicates the general location of trouble. In many instances the information gained will determine the exact nature of the fault. In order for this information to be utilized fully, all symptoms must be interpreted in relation to one another.

(4) *Transmitter trouble-shooting charts.* The trouble symptoms listed in these charts (pars. 46 and 47) will aid greatly in localizing trouble in the transmitter, power supply, and battery-charging panel.

40. Trouble-shooting Data

Take advantage of the material supplied in this manual. It will help in the rapid location of faults. Consult the following trouble-shooting data:

Fig. No.	Description
3	Radio Transmitting Set AN/SRT–1A, cover removed.
16	Control circuits.
17	Radio Transmitting Set AN/SRT–1A, top view.
18	Battery and power supply compartment, top view.
19	Radio Transmitting Set AN/SRT–1A, bottom view.
20	Battery-charging panel, rear view.
21	Voltage-resistance diagram.
24	Radio Transmitting Set AN/SRT–1A, schematic diagram.
25	Battery-charging panel, schematic diagram.

41. Test and Repair Equipment

The following tools, materials, and test equipment or equivalent, are needed for reconditioning, adjusting, and repairing Radio Transmitting Set AN/SRT–1A:

a. TOOLS AND MATERIALS.

Signal Corps stock No.	Name of tool and description	Use
6A15310	Screwdriver TL–21, bit 3/16" wide by .032" thick.	Tighten or remove screws.
6R55006	Wrench TL–111, adjustable single open-end, 3/4" maximum opening, 6" size.	Tighten or remove parts.

b. TEST EQUIPMENT.

Name and description	Use
Multimeter TS–352/U: d-c milliammeter and voltmeter.	Check transmitter currents and voltages.
Ammeter I–20–B: r-f ammeter	Adjust antenna coupling.
0- to 15-ampere d-c ammeter	Check battery drain.
10-ohm, 10-watt, noninductive resistor	Check power output.

Note. In addition to the above listed items, any standard accurately calibrated receiver may be used for checking the transmitter frequency.

42. General Precautions

Whenever a transmitter is to be serviced, observe the following precautions very carefully:

a. Prevent overheating. Do not allow the motor to run too long.

b. Be careful when the transmitter is removed from the suitcase: high voltage (500 volts) is exposed.

c. Careless replacement of parts often makes new faults inevitable. Note the following points:

(1) Before a part is unsoldered, note the position of the leads. If a part has a number of connections, tag each of the leads to it.

(2) Be careful not to damage other leads by pulling or pushing them out of the way.

(3) Do not allow drops of solder to fall into the set; they may cause short circuits.

(4) A carelessly soldered connection may create a new fault.

It is very important to make well-soldered joints because a poorly soldered joint is one of the most difficult faults to find.

(5) When a part is replaced in the r-f circuit, it must be placed exactly as the original one was. A part which has the same electrical value but a different size may cause trouble in high-frequency circuits. Give particular attention to proper grounding when replacing a part. Use the same ground point as in the original wiring. Failure to observe these precautions may result in improper operation.

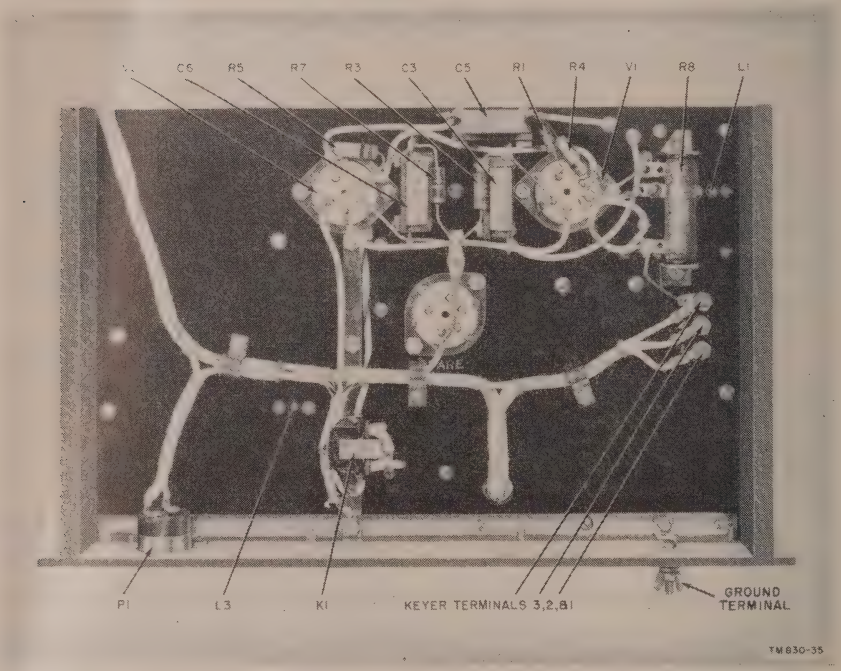


Figure 19. Radio Transmitting Set AN/SRT–1A, bottom view.

43. Visual Inspection

Note. The information in this paragraph is somewhat tactical in nature and will be modified in accordance with local tactical doctrine and SOP.

a. To remove the transmitter from the suitcase, remove the seven wood screws located at the top and two sides of the transmitter panel. Remove the clamping bar across the battery compartment and slide the battery tray and vibrator power supply out. Remove the wires attached to terminals 1 to 4 on the terminal

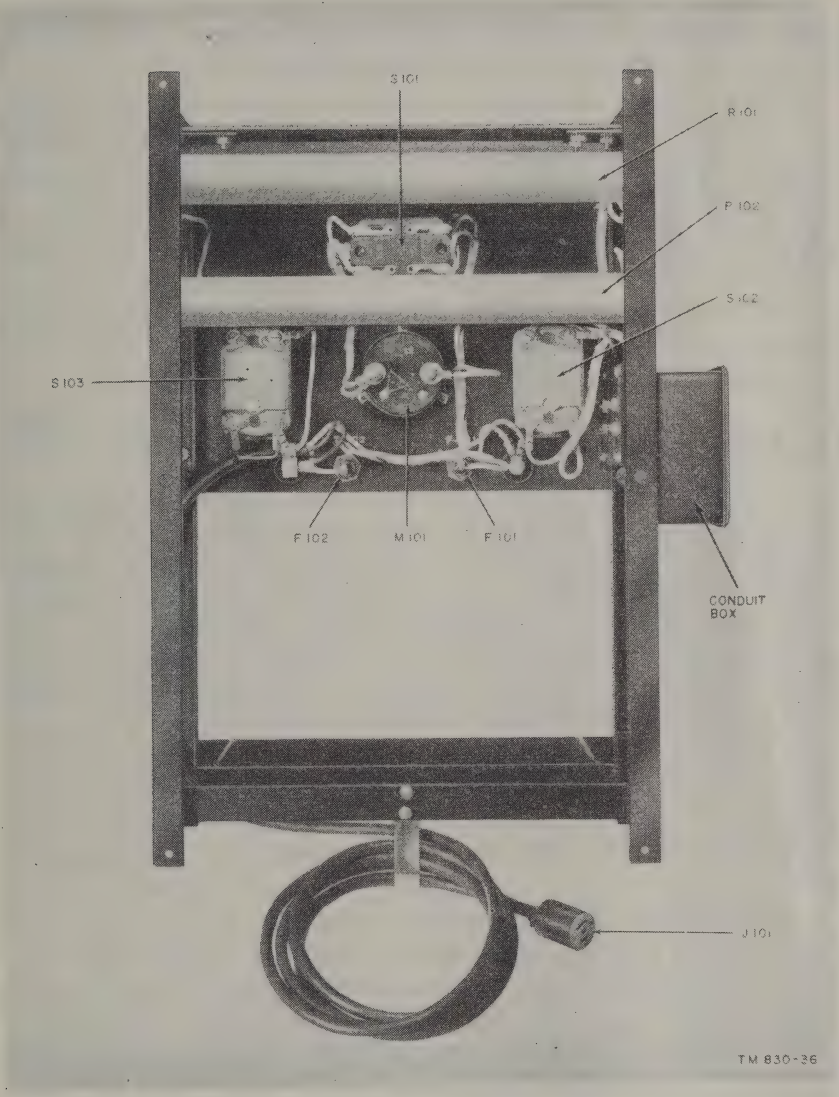


Figure 20. Battery-charging panel, rear view.

board near the vibrator unit. Pull the battery and vibrator power supply out of the suitcase and set them aside. Carefully pull the transmitter out of the case, feeding the wire up through the hole in the shelf until the transmitter is free of the case.

b. Examine for burned insulation and resistors. Examine for wax leakage and any discoloration of apparatus and wire. Examine all parts and surfaces for the effects of corrosion.

c. Inspect for broken connections to tube sockets, plugs, and other apparatus as well as for defective soldered connections. Examine for bare wires touching other wires.

d. Be sure that the labels on the tubes in the various sockets correspond to the correct tube types for these positions (1624 is the only tube type used in the equipment). Replace any tubes which have the wrong numbers. Inspect for loose tube sockets.

e. Check carefully for short circuits.

f. Inspect the switches for loose and bent parts.

g. Inspect the power cable to the vibrator power supply for loose connections or short circuits.

h. Inspect for loose or missing screws.

44. Power Supply Tests

a. The output voltage of the vibrator power supply, as measured between terminals 2 and 4 on the terminal board near the vibrator (fig. 18), should be approximately 500 volts. The battery voltage, as measured between terminals 1 and 4, should be approximately 6 volts when the batteries are fully charged. These measurements may be made with an ordinary d-c voltmeter having the proper ranges. With the transmitter operating, the output current from the power supply will be from 80 to 90 ma when the transmitter is properly tuned and loaded. Connect a 0- to 100-ma meter in series with the lead to terminal 2 (fig. 18). The current drawn from the batteries will be from 12.5 to 14.5 amperes; connect a 0- to 20-ampere meter in series with the lead to terminal 4 for this measurement.

b. If no voltage is measured from terminals 2 to 4 when the transmitter is started, listen for a humming sound from the vibrator. If the humming sound is not present, remove the vibrator after loosening the clamp around the base and disconnecting the ground lead which runs from the top of the vibrator to a stud on the chassis. Before installing the spare vibrator, check for possible short circuits which may have caused vibrator failure. Refer to step 8 of the trouble-shooting chart (par. 46) and to the tube socket voltage-resistance diagram (fig. 21). Inspect battery connections for good contact and proper polarity. The ground for the battery is obtained by connection from the wingnut on the right-hand side of the panel (fig. 18) to the stud on the vibrator chassis.

c. Inspect connections to the terminal board at the base of the vibrator power supply to see that the wires are properly connected and are making good contact. The wire with the orange and black tracer should connect from the terminal marked B+ on the base of

the power supply to terminal 2 on the terminal board. The wire with the blue tracer should connect from the terminal marked START to terminal 3 on the terminal board.

45. Operational Test

Operate the equipment as described in the equipment performance checklist (par. 24). The equipment performance test is important because it frequently indicates the general location of the trouble.

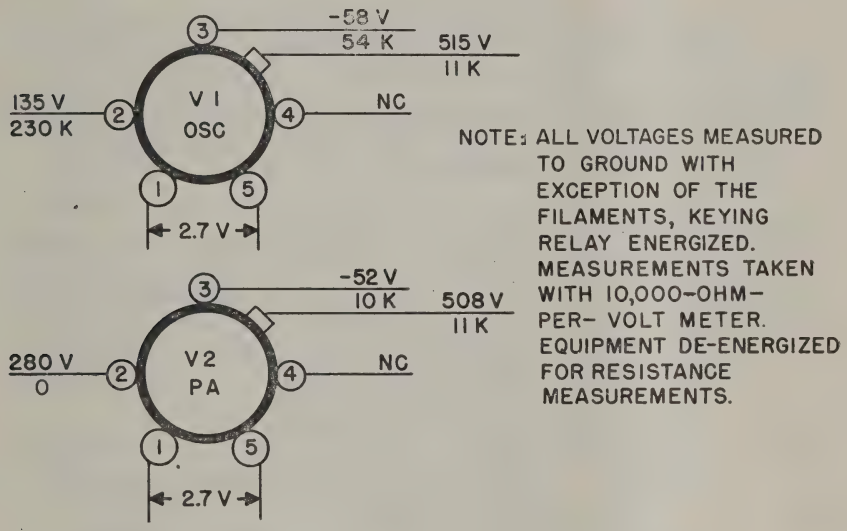


Figure 21. Voltage-resistance diagram.

46. Transmitter Trouble-shooting Chart

The following chart is supplied as an aid in localizing trouble. The chart lists the symptoms which the technician may observe while making a few simple tests. Nominal voltage and resistance measurements, subject to approximately 20 percent variation, are listed in figure 21.

Symptom	Probable trouble	Correction
1. Transmitter is completely inoperative when START SWITCH is pressed.	Check for loose or disconnected battery leads.	Connect and/or tighten leads.
	Check for loose or disconnected leads from vibrator chassis to terminal board behind battery.	Connect and/or tighten leads.
	Check for discharged battery.	Recharge.
	Check for faulty START SWITCH by shorting switch terminals.	Replace defective switch.
2. Transmitter operates only as long as START SWITCH is pressed.	Limit switch S4 improperly adjusted or defective.	Adjust or replace S4 (par. 50*d*).
3. Filaments light but motor does not run when START SWITCH is pressed.	Check for loose or wrong connections to terminals 1, 2, and 3 on transmitter chassis (figs. 17 and 19): yellow wire to terminal 1, red to terminal 2, and white to terminal 3.	Correct wrong connections; tighten loose connections.
	Check for open potentiometer R9.	Replace defective potentiometer.
	Check for defective motor.	Replace defective motor. (see par. 48*b*.)
4. Motor runs but filaments do not light when START SWITCH is pressed.	Check for burned-out tubes.	Replace if defective.
	Check for open potentiometer R8.	Replace if defective.
5. Transmitter does not key automatically when START SWITCH is pressed (SIGNAL SWITCH in SOS position).	Check for defective chopper operation by shorting chopper contact to ground.	Replace contact if defective.
	Check for open relay coil K1.	Replace relay.
	Check for faulty contacts on K1.	Replace relay.
	Check for defective SOS switch by shorting terminals 1 and 3 on the transmitter chassis (fig. 17).	Readjust contact pressure (par. 50*d*); replace switch if completely defective.

Symptom	Probable trouble	Correction
	Check for defective SIGNAL SWITCH by placing switch in KEY position and pressing START SWITCH.	Replace if defective.
	Check for loss of operating voltages. See figure 21 and the check procedures under step 10 below.	See corrective measures under step 10.
6. Transmitter cannot be keyed manually when START SWITCH is pressed (SIGNAL SWITCH in KEY position).	Check for loose or open leads to key K2.	Connect and/or tighten leads.
	Check for loss of operating voltages. See figure 21 and the check procedures under step 10 below.	See corrective measures under step 10 below.
	SIGNAL SWITCH S5 defective.	Replace switch.
7. Transmitter does not shut down at the end of 2-minute cycle.	Check for defective or improperly adjusted limit switch S4.	Readjust switch (par. 50*d*); replace if completely defective.
	Check for defective START SWITCH.	Replace if defective.
8. Vibrator power supply smokes, smells, or overheats.	Check for short from terminal 2 on the power supply terminal board (or any point connecting to terminal 2) to ground. Check particularly C4, C7, C10, and C11.	Replace defective component.
9. Transmitter will not tune to 500 kc (detectable frequency meter or calibrated receiver).	Check for shorted tuning coil L1 or shorted capacitor C1 or C2.	Replace defective component.
10. Motor runs, tubes light, but TUNING INDICATOR does not glow.	Check for defective glow lamp I1.	Substitute spare lamp.
	Check for poor antenna or ground connections.	Tighten connections.
	Check for improper alinement.	Check tuning (par. 51 through 55).
	Check for low filament voltage.	Adjust potentiometer R8.
	Check continuity of coils L3 and L4.	Replace if defective.

Symptom	Probable trouble	Correction
	Check contacts of S1 and S2 (fig. 17).	Clean, adjust, or replace.
	Check for output from vibrator on terminal 2 of the power supply terminal board (fig. 18).	Replace defective vibrator.
	Check for loss of plate voltage on oscillator V1.	Replace open resistor R2, open coil L1, or shorted capacitor C4.
	Check for loss of screen voltage on oscillator V1.	Replace open resistor R3 or shorted capacitor C3.
	Check for open V1 grid circuit (no bias).	Replace open resistor R1 or R4; replace defective chopper.
	Check for loss of power amplifier (V2) plate voltage.	Replace open coil L2, open resistor R6, or shorted capacitor C4.
	Check for loss of power amplifier (V2) screen voltage.	Replace open resistor R7, shorted capacitor C6, or defective relay K1.
	Check for open power amplifier (V2) grid circuit.	Replace open resistor R5 or defective chopper.

47. Battery-charging Panel Trouble Shooting Chart

The following chart is supplied as an aid in locating trouble in the battery-charging panel. The chart lists the symptoms which the operator may observe while making a few simple tests.

Symptom	Probable trouble	Correction
When LINE SWITCH is thrown to ON position, meter does not indicate.	Defective or blown fuse.	Replace fuse.
	Battery or other terminal connections loose.	Tighten connections.
	Open resistor R101 or R102.	Replace resistor.
	Defective meter M101.	Replace meter.
	Defective switch S102.	Replace switch.
Meter indicates in wrong direction.	Line connections reversed.	Reverse input connections.
Meter indicates a value different from .5 or 1.0 ampere.	LINE VOLTAGE switch in wrong position for line voltage.	Check line voltage and set LINE VOLTAGE switch to proper value.

Symptom	Probable trouble	Correction
	Line voltage too high or too low.	Regulate line voltage, if possible.
	Power resistor (R101 or R102) damaged.	Replace resistor.
	Defective meter M101	Replace meter.
	Short circuit	Replace defective wiring.

Section II. REPAIRS

48. Replacement of Parts

a. Most of the parts in Radio Transmitting Set AN/SRT–1A are readily accessible and are replaced easily. A spare tube (type 1624) is in a dummy socket just to the rear of the manual key. A spare TUNING INDICATOR lamp is in a clip on the rear of the keyer mechanism. Spare fuses for the battery-charging panel should be stored near the place where the panel is installed.

b. If the keyer unit is found to be defective, it may be replaced easily by removing three screws and disconnecting four wires. Disconnect terminal lugs 1, 2, and 3 from the chassis (fig. 17) and disconnect the wire to the chopper disk contact (green tracer). Removal of the three No. 8–32 screws which pass through the chassis will release the entire assembly. Replace the entire unit if it is defective, because the adjustment of the unit is complicated and critical. To replace the keyer, reverse the above procedure. Be careful to connect the proper lugs to the terminals on the chassis, yellow wire to terminal 1, red to terminal 2, and white to terminal 3.

c. The remaining components on the chassis may be replaced as follows by qualified personnel. Carefully note the manner in which the present part is mounted, and remove and replace the new part in a similar position. In replacing switches, coils, etc., be careful to tag or mark wires so that the new unit will be wired exactly as the old. Follow this practice whenever replacement requires the disconnection of numerous wires.

49. Refinishing

a. The transmitter unit should never need refinishing. The suitcase may be touched up with chrome yellow (zinc chromate) acid-resistant paint on the outside and black acid-resistant paint on the inside.

b. The battery-charging panel may be retouched or refinished, if necessary, with any good, black, acid-resistant paint.

50. Apparatus Adjustment

a. TELEGRAPH KEY K2. Remove the transmitter from its case to adjust the spacing and tension on the telegraph key. Three adjustments are provided on the key. Tension may be adjusted by means of the knurled screw (fig. 17) nearest the panel; the contacts may be alined one above the other by means of the knurled screws at the center of the key; and spacing of the contacts may be adjusted by means of the knurled screw toward the rear of the key. Since the key usually will not be adjusted for the personal touch of any one operator, a medium tension and a spacing of one-sixteenth inch is adequate.

b. KEYING RELAY K1. The keying relay (K1) has no adjustment. If it fails to function properly, carefully note the manner in which it is installed and replace it with a new unit.

c. MOTOR SPEED. The keyer unit motor speed may be adjusted by means of the 1-ohm resistor (R9) mounted under the keyer base. The speed of the keyer motor may be checked in several ways.

(1) The interrupter for modulating the transmitter is connected directly to the motor shaft and should operate at 3,600 rpm with a resulting 840-cycle note. This note may be compared to the output of a calibrated audio oscillator for a rough check on motor speed. The adjustment is not critical.

(2) The SOS long-dash cam should make 1 revolution in approximately 20 seconds (3 rpm), or 6 revolutions in the normal 2-minute keying cycle. Each complete revolution of this cam results in the transmission of SOS three times, one long-dash (approximately 2.6 seconds), and a silent interval (approximately 2.75 seconds). The SOS is transmitted at a rate of about eight words per minute.

(3) The limit cam makes one complete revolution in approximately 2 minutes (½ rpm). When this cam completes one revolution, the contact arm of limit switch S4 falls into a detent, opening the switch, stopping the motor, and disconnecting the filament supply.

d. SOS AND LIMIT SWITCHES. Both SOS switch S3 and limit switch S4 (fig. 10) are enclosed, snap-action microswitches, normally open, requiring relatively little pressure on their contact arms to close. These two switches may be adjusted for proper

operation by loosening the screw which is exposed on the mounting plate and sliding that end of the plate up or down until the arms of the switches are pressed or released sufficiently (by the detent in the limit cam or the bumps on the SOS cam) to operate the switches properly. Carefully tighten the loosened screw so that the switches will remain in their adjusted positions.

Section III. ALINEMENT AND FINAL TESTING

51. Test Equipment Required

a. Either a calibrated receiver or a frequency meter is required for tuning of the oscillator.

b. A 0- to 100-ma d-c milliammeter is required for the most accurate tuning of the power amplifier.

c. A 0- to 1-ampere r-f ammeter will allow more accurate tuning of the antenna circuit than the panel mounted TUNING INDICATOR.

d. A 10-ohm, 10-watt noninductive resistor is required as a dummy load when tuning the antenna circuit.

e. A bakelite or bone-fiber alinement tool is required for adjustment of the oscillator and power amplifier tuning slugs. A long-handled tool will help to minimize any detuning effects caused by the hand of the person making the tuning adjustments.

52. Equipment Set-up

a. Remove the transmitter from the case (par. 43*a*) to allow access to the transmitter chassis.

b. Reconnect the power and control circuit connections (disconnected while removing the transmitter). If suitable external power is available the battery life may be conserved by connecting the transmitter to the external supply. If an external power source is used, the leads normally connected from the battery to terminals 1 and 4 on the terminal strip near the vibrator should be connected to a 6-volt source; the lead normally connected from the vibrator chassis to terminal 2 should be connected to a 500-volt source; and the lead which normally connects from the vibrator chassis to terminal 3 may be left open.

c. Place the SIGNAL SWITCH of the transmitter in the KEY position. The hand key may then be utilized to energize the keying relay while the tuning adjustments are being made. Note, however, that the transmitter will still run for only 2 minutes after the START SWITCH is pressed.

Note. Tuning adjustments may be facilitated by shorting the chopper contact to ground. This will result in a constant note when a receiver is used as a monitor or a definite zero beat when a frequency meter is used.

53. Oscillator Tuning

a. Connect the artificial antenna capacitor and a 10-ohm, 10-watt, noninductive resistor in series between the ANTENNA TERMINAL and the GROUND TERMINAL.

b. Loosen the locknut on the threaded shaft of the tuning slug in oscillator coil L1 (fig. 17).

c. Tune a calibrated receiver to 500 kc or calibrate a frequency meter for 500 kc. Allow approximately 15 minutes for the test equipment to warm up.

d. Press the START SWITCH of the transmitter.

e. Depress the hand key and, using an insulated alinement tool, adjust the tuning slug of L1 for maximum (loudest) output on the calibrated receiver. Alternately, adjust L1 for a zero-beat indication with the output of the frequency meter. Each time the oscillator adjustment is changed, it will be necessary to readjust the ANTENNA TUNING control. When the maximum (or zero-beat) indication is obtained, lock the shaft of the tuning slug by tightening the locknut. Take care to prevent the shaft from turning while the locknut is being tightened.

Note. The screw driver and the hand of the person making the adjustment will have a detuning effect on the oscillator, so that the maximum (or zero-beat) signal present while adjusting the tuning slug will not be a true indication. It will be necessary to make repeated adjustments until the maximum (or zero-beat) indication is obtained, when the screw driver is removed from the vicinity of the coil.

54. Power Amplifier Tuning

a. Connect a 0- to 100-ma d-c milliammeter in series with the 500-volt lead to the transmitter.

b. Disconnect the artificial antenna capacitor and the 10-ohm resistor.

c. Loosen the locknut on the shaft of power amplifier coil L3 (fig. 17).

d. Press the START SWITCH, depress the hand key, and adjust the tuning slug of L3 for a minimum reading on the milliammeter (between 75 and 85 ma).

e. Adjustment of L3 may cause detuning of the oscillator. Repeat the oscillator tuning and the adjustment of L3 until a minimum indication occurs at 500 kc. Tighten the locknut on the shaft of L3.

55. Antenna Circuit Tuning

Make the antenna tuning adjustments listed below with the artificial antenna capacitor, the 10-ohm, 10-watt resistor, and a 0- to 1-ampere r-f ammeter connected between the ANTENNA TERMINAL and the GROUND TERMINAL.

a. Remove the plug above and to the left of the ANTENNA TUNING control on the panel of the transmitter (fig. 6) to gain access to the screw driver adjustable coupling switch, S1. Insert a screw driver in the slotted shaft on S1 and turn the switch to its maximum counterclockwise position.

b. Place the ANTENNA SELECTOR switch on position 4 and press the START SWITCH.

c. Depress the hand key (with the SIGNAL SWITCH in the KEY position) and resonate the antenna circuit by means of the ANTENNA TUNING control; adjust the control for a maximum indication on the meter or, if a meter is not available, adjust for maximum brilliance of the TUNING INDICATOR lamp. If a resonance indication is not obtained by adjusting the ANTENNA TUNING control, change the position of the ANTENNA SELECTOR switch and repeat the procedure.

d. Repeat step *c* above for each of the six positions of the antenna coupling switch. Leave the antenna coupling switch at the position which results in the maximum meter indication or maximum brilliance of the TUNING INDICATOR lamp. A reading of at least .75 ampere should be obtained if the batteries are fully charged.

e. Replace the plug in the access hole for the coupling switch, remove the artificial antenna capacitor, 10-ohm resistor, and r-f ammeter, and return the transmitter to its case, taking care to restore the original connections.

56. Final Testing

This paragraph is intended as a guide in determining the quality of a repaired Radio Transmitting Set AN/SRT–1A. The minimum test requirements outlined in figure 21 will tell whether the transmitter has been repaired properly. The tests may be performed by maintenance personnel with adequate test equipment and the necessary skills. Actual values may vary somewhat from those specified in figure 21, because these are merely a guide to approximate operating conditions. As long as the power output is over 5.5 watts at 500 kc (with a fully charged battery), and the battery drain is under 14.5 amperes, the transmitter is operating properly.

CHAPTER 6

SHIPMENT AND LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

57. Disassembly

Radio Transmitting Set AN/SRT–1A needs no disassembly to prepare it for storage. Be sure all the spare equipment is stowed in the suitcase (spare antenna wire, ground, vibrator, artificial antenna capacitor, etc.).

58. Care of Batteries During Storage or Shipment

a. For a limited storage time of not more than a month, charge the batteries to full charge and store them separately from other equipment.

b. For shipment of batteries, see JAN–P–208A.

59. Repacking for Shipment or Limited Storage

See paragraph 12 for information on packing and shipment.

Section II. DEMOLITION OF MATÉRIEL TO PREVENT ENEMY USE

60. General

The demolition procedures outlined in paragraph 61 will be used to prevent the enemy from using or salvaging this equipment. Demolition of the equipment will be accomplished only upon order of the commander.

61. Methods of Destruction

a. SMASH. Smash the controls, tubes, resistors, coils, switches, capacitors, transformer, batteries, panels, motor, cams, and meter, using sledges, axes, handaxes, pickaxes, hammers, crowbars, or heavy tools.

b. CUT. Cut cords and wiring, using axes, handaxes, or machetes.

c. BURN. Burn cords, resistors, capacitors, coils, wiring, and technical manuals, using gasoline, kerosene, oil, flame throwers, or incendiary grenades.

d. BEND. Bend panels, cabinets, and chassis.

e. EXPLOSIVES. If explosives are necessary, use firearms, grenades, or TNT.

f. DISPOSAL. Throw the destroyed parts into the water.

g. OTHER. Destroy everything.

APPENDIX I
REFERENCES

Note. For availability of items listed, check SR 310–20–3 and SR 310–20–4. Check Department of the Army Supply Catalog SIG 1 for Signal Corps supply catalog pamphlets.

1. Army Regulations

AR 380–5	Safeguarding Military Information.
AR 750–5	Maintenance of Supplies and Equipment: Maintenance Responsibilities and Shop Operation.

2. Supply Publications

SIG 1	Introduction and Index.
SIG 5	Stock List of all Items.
SIG 7 & 8	Organizational Maintenance Allowances and Field and Depot Maintenance Stockage Guide.
SB 11–76	Signal Corps Kit and Materials for Moisture- and Fungi-Resistant Treatment.

3. Painting, Preserving, and Lubrication

TB SIG 13	Moistureproofing and Fungiproofing Signal Corps Equipment.

4. Military (MIL and JAN) Specifications

JAN–P–207	Packaging and Packing for Overseas Shipment-Electrolyte; Storage Battery (in U. S. 1-gallon or imperial 1-gallon bottles).
JAN–P–208A	Packaging and Packing for Overseas Shipment-Batteries, Storage, Automotive and Navy Portable.

5. Other Publications

TM 11–430	Batteries for Signal Communication. Except those pertaining to Aircraft.

TM 11–455	Radio Fundamentals.
TM 11–681	Electrical Fundamentals (Alternating Current).
TM 11–661	Electrical Fundamentals (Direct Current).
TM 11–4000	Trouble Shooting and Repair of Radio Equipment.

6. Abbreviations

dc	direct current
icw	interrupted continuous wave
kc	kilocycle
ma	milliampere
mo	master oscillator
pa	power amplifier
r-f	radio-frequency
rpm	revolutions per minute
μf	microfarad
$\mu\mu$f	micromicrofarad

7. Glossary

For explanation of the terms used in this manual, refer to TM 11–455.

APPENDIX II
IDENTIFICATION TABLE OF PARTS

1. Requisitioning Parts

The fact that a part is listed in this table is not sufficient basis for requisitioning the item. Requisitions must cite an authorized basis, such as a specific T/O&E, T/A, SIG 7 & 8, list of allowances of expendable material, or another authorized supply basis. The Department of the Army Supply Catalog applicable to the equipment covered in this manual is SIG 7 & 8–AN/SRT–1. For an index of available supply catalogs in the Signal portion of the Department of the Army Supply Catalog, see the latest issue of SIG 1.

2. Identification Table of Parts for Radio Transmitting Set AN/SRT–1A

Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
	RADIO TRANSMITTING SET AN/SRT–1A: MCW; 500 kc; output 5w; input 6 v DC, 11 amp; mtd in waterproof wood carrying case w/web straps; 16″ wd x 12″ h x 18″ d o/a; complete w/3 ea batt #3B54 dry charged; incl spare tube, neon bulb, ant and gnd wires w/set wood ins and technical manual; sends automatic SOS for 2 min on pushing start button or may be keyed manually; U. S. Army spec #71–3301.	To send automatic SOS signals from lifeboat when in distress.	2C6657
B1	MOTOR, DC: shunt wnd w/3d lead from arm for speed control; torque 1″ –oz at 3600 rpm; closed frame; 2 pole; 40 deg temp rise; impr; plain SS shaft; 2$\frac{9}{16}$″ lg x 1$\frac{5}{8}$″ d, .250″ d shaft $\frac{7}{8}$″ lg from front; 6 v DC; 2 amp; .0035 hp at 3600 rpm; cw rotation mts four #6–32 tapped holes, 90 deg spacing on rear; ball bearings packed w/silicon grease; silver commutator and silver graphite brushes, all brass nickel pl, all aluminum anodized; leads in accordance w/JAN–C–76(4).	Drives keyer mechanism	3H2725.1
BT1,2,3	BATTERY, storage: Sig C Battery BB–54–A; portable; plexine ctr; 2 v; 3$\frac{31}{32}$″ lg x 3″ wd x 5$\frac{1}{2}$″ d; single cell; 28 amp-hr cap at 20 hr rate; discharge rate 1.4 amp in 20 hr; 11 plates; lead plates; fibrite separators; acid electrolyte; dry charged; nut and bolt term; Sig C spec #70–400.	To supply power for the operation of the radio transmitter.	3B54
C1	CAPACITOR, fixed: mica; 1000 $\mu\mu$f $\pm$2%; 2500 vdcw; JAN type CM45B–102G; spec JAN C–5(3).	Oscillator tuning	3K4510223
C2	CAPACITOR, fixed: mica; 270 $\mu\mu$f $\pm$5%; 2500 vdcw; JAN type CM45B–271J; spec JAN C–5(3).	Oscillator grid coupling	3K4527122
C3 through C7	CAPACITOR, fixed: mica; 4300 $\mu\mu$f $\pm$5%; 2500 vdcw; JAN type CM50B–432J; spec JAN C–5(3).	C3: Oscillator screen bypass C4: Oscillator plate decoupling	3K5043222

Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
		C5: Power amplifier grid coupling C6: Power amplifier screen bypass C7: Power amplifier plate blocking	
C10	CAPACITOR, fixed: paper; 10,000 $\mu\mu$f ±10%; 1500 vdcw; JAN type CP28A1EH103K.	Buffer capacitor for vibrator	3DA10–485
C11	CAPACITOR, fixed: paper; 1 μf +20% —10%; 600 vdcw; JAN type CP53B1EF105V.	Filters B+ supply	3DB1–83
C8	CAPACITOR, fixed: mica; 1000 $\mu\mu$f ±5%; 3000 v peak working; JAN type CM65B–102J; spec JAN C–5(3).	Power amplifier tank tuning	3K6510222
C9	CAPACITOR, fixed: mica; 100 $\mu\mu$f ±5%; 5000 v peak working; JAN type CM70B–101J; spec JAN C–5(3).	Dummy antenna capacitor	3K7010122
E1	VIBRATOR, synchronous: input 6 v DC, 11 amp; single reed, 130 cps ±8 cps; driving coil 6 vdcw; tubular shape 1 9/16" dia x 3⅛" h excluding prongs; base connection C–3; HS; 3/16" d hole in top with 3¾" ins lg wire lead.	Converts dc from battery to ac, and rectifies stepped-up voltage.	3H6694–16
E2	KEYER: incl d-c motor (B1), gear train, interrupter disk, SOS cam, limit cam, and 2 microswitches (S3 and S4); interrupter disk driven directly at 3600 rpm; SOS cam driven through gear train at 3 rpm; limit cam driven through gear train at ½ rpm; microswitches operative through action of SOS and limit cams.	Provides automatic keying of the transmitter.	2C2371
E3	INSULATOR, feedthru: conical shape; JAN type NS4W4104 for male sect, JAN type NS4W4204 for female sect; cond is 3½" lg; #10–32 thd stud; incl three #10–32 nuts, one #10–32 wingnut, 3 lockwashers, and 4 flat washers; lead washer 1⅛" d x 1/32" thk w/¾" d hole furnished for use between ceramic sect; Pat-MacGuyer term #3044 supplied for connecting antenna lead; ceramic parts according to JAN–I–8(1).	Antenna connector	3G3541–04.1 3G3542–04.1

I1	LAMP, glow: 105 to 125 v AC or DC; bulb T–4½; double cont bayonet base candelabra; 1½" lg; starting 65 v AC, 90 v DC.	TUNING INDICATOR lamp	2J991
I2	LAMPHOLDER (for TUNING INDICATOR lamp I1): w/ lens; 1" d clear lens; for T–4½ double cont bayonet base neon lamp; encl shell; nickel pl brass shell; 2¾" lg x 1¼" d; 1" d mtg hold required, ½" max panel thk; socket may be mtd in any position, lamp replaceable from front; jewel cap is thd; 2 solder lug term located on opposite sides of base.	Socket for I1	2Z5991–152
I3	HYDROMETER, battery: sulphuric acid, float type graduated from 1100 to 1300; bulb 2" OD x 3" lg, barrel 1⅛" OD x 7½" lg; rubber tube 3⅛" lg; no thermometer.	Battery tester	3B2234
K1	RELAY, keying: SPDT; cont rating ¾ amp, 40 w; silver cont; single wnd, 1.2 v DC, 25 ma, 50 ohms, ins; 10" leads on coil, lugs on cont; 1$^{9}/_{32}$" lg x 1$^{1}/_{32}$" wd x 1$^{1}/_{32}$" h; two #6–32 holes on .437" mtg ctrs; fast acting; impr and tropicalized; JAN–T–152, JAN–C–173(1).	Keying relay	2Z7585–188
K2	KEY, telegraph: Sig C Key J–37; manual; 5$^{3}/_{16}$" lg x 2⅝" wd x 1" h o/a; Sig C dwg #RL–5923; (upper cont $^{5}/_{32}$" coin silver, bottom cont $^{3}/_{16}$" hex coin silver; steel cont lever, 3-way adj; phenolic oval base, 3" max dia, three #6–32 tapped mtg inserts approx 1$^{7}/_{32}$" ctr; 2 binding post term).	Manual telegraph key	3Z3437
L1	COIL, RF: osc pl tank; single layer wnd; unshielded; 68 turns #20/38 enameled Litz; 4" lg x 1¼" d; powdered iron core; scdr adj from top or bottom; mts w/two #6–32 screw holes on ⅝" ctrs; 3 ins leads 6" lg, one top, one bottom, one 18 turns from top; impr and tropicalized.	Oscillator tuning	3C1084Z72–1
L2	COIL, RF: choke; 4 two-lap universal wnd; unshielded; inductance 15 mh at 500 kc, 22.5 ohms resistance approx; 3½" lg x 1$^{11}/_{16}$" d; bakelite form, air core; form 3½" lg x 1" d; mts w/single #8–32 screw into ctr of bottom; 2 lug term,	Power amplifier plate choke	3C323–26D

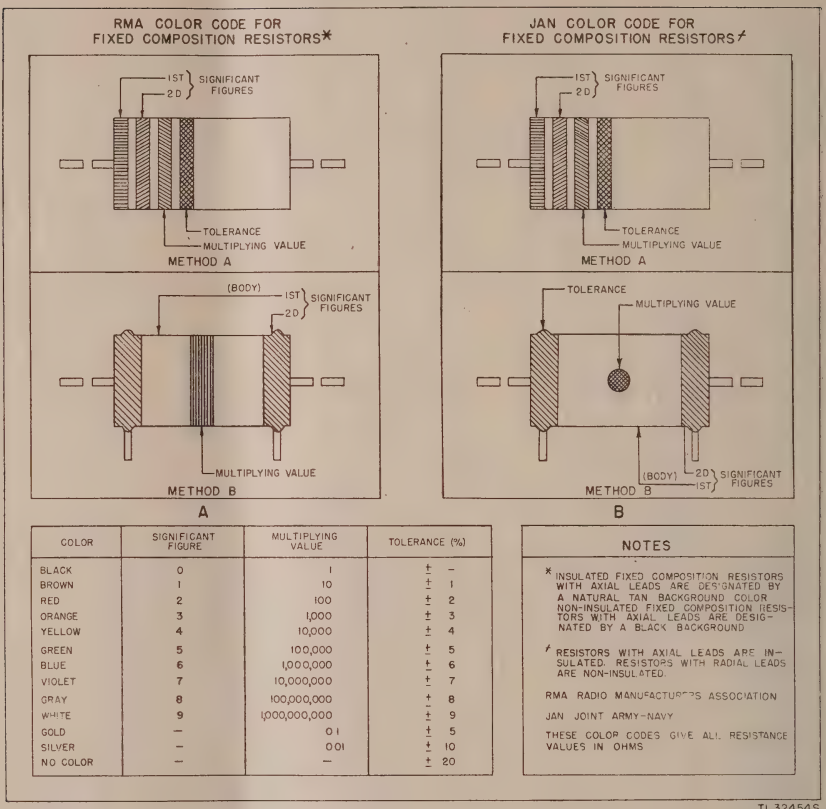
Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
	one each end; impr and tropicalized; p/o Radio Transmitting Set AN/SRT–1A.		
L3	COIL, RF: power amplifier plate; single layer wnd; unshielded; 67 turns #20/38 enameled Litz; 4″ lg x 1¼″ d; powdered iron core; scdr adj from top or bottom; mts w/two #6–32 screws on ⅝″ ctrs; 8 ins leads 6″ lg; impr and tropicalized.	Power amplifier tuning	3C1084Z72
L4	COIL, RF: ant load; 3 single layer wnd; unshielded; 164 turns #20/38 Litz; 6″ lg x 3¾″ d; bakelite form, air core; variometer type tuning; tuning shaft extends through side of coil form; mts by means of 3 angle brackets w/#6–32 screws 120 deg spacing on 2¼″ radius; 1 lug term, four 6″ leads; impr.	Antenna loading coil	2C6657/C1
P1	CONNECTOR, receptacle: 2 curved male cont pol; straight type; 1⅝″ d x 15/16″ h o/a; 10 amp, 250 v; round steel flush mtg flange; bakelite insert; 2 5/32″ d holes on 1⅜″ ctrs; midget Twist-lock.	Charging receptacle	6Z815
R1	RESISTOR, fixed: comp; JAN type RC21BF101J; 100 ohms ±5%; spec JAN–R–11(3).	Oscillator grid parasitic suppressor	3RC21BF101J
R2,R6	RESISTOR, fixed: WW; JAN type RW30F160; 16 ohms ±5%; spec JAN–R–26A(2).	R2: Oscillator plate parasitic suppressor. R6: Power amplifier plate parasitic suppressor.	3RW13514
R3	RESISTOR, fixed: comp; JAN type RC40BF204J; 200,000 ohms ±5%; spec JAN–R–11(3).	Oscillator screen voltage dropping	3RC40BF204J
R4	RESISTOR, fixed: comp; JAN type RC30BF513J; 51,000 ohms ±5%; spec JAN–R–11(3).	Oscillator grid leak	3RC30BF513J
R5	RESISTOR, fixed: comp; JAN type RC30BF103J; 10,000 ohms ±5%; spec JAN–R–11(3).	Power amplifier grid lead	3RC30BF103J

R7	RESISTOR, fixed: comp; JAN type RC40BF103J; 10,000 ohms ±5%; spec JAN–R–11(3).	Power amplifier screen voltage dropping.	3RC40BF103J
R8,R9	RESISTOR, adjustable: WW; 1 ohm ±10%; 25 w; Ohmite #0360; vitreous enameled, porcelain core; 2″ lg x 9/16″ d; mtg bracket; mtg/c 2¾″.	R8: Filament voltage adjusting R9: Keyer motor speed control	3Z5991–13
S1	SWITCH, rotary: ant coupling; 1 pole, 6 position; 50 ma, 300 v; silver cont; nonshorting cont; lug term; mts by two #6–32 x ⅝″ studs and 2 hex spacers on 2″ ctrs; all body metal SS; Mallory #B–115958–Sub 1-Class C; bakelite parts according to JAN–P–13.	Antenna coupling switch	3Z9825–33.12
S2	SWITCH, rotary: ant selector; 1 pole, 4 position; 2 amp, 1000 v; silver cont; nonshorting cont; lug term; single sect, ceramic body; 3 21/32″ lg x 2 13/16″ wd x 3⅜″ h; (lucite shaft ½″ d x 1 1/16″ lg; two #8–32 tapped holes on 2⅞″ ctrs; ins break-down test 3000 v DC.	ANTENNA SELECTOR switch	3Z9825–22.1
S3,S4	SWITCH, sensitive: SPST; 10 amp, 125 v; 5 amp, 250 v; bakelite case; 2 13/16″ lg x ⅞″ h x 1 1/16″ wd o/a; leaf type ext for actuating; 1 to 2 oz oper pressure; normally open, screw type term, 2 holes, ID .139″, 1″ between ctrs for mtg; connection by means of screws in back of case.	S3: SOS switch S4: Limit switch	3Z9561
S5	SWITCH, toggle: DPDT; JAN type ST–26–N; spec JAN–S–23(2).	SIGNAL SWITCH	3Z9863–26N
S6	SWITCH, sensitive: SPST; phenolic case, yellow top, 1 15/16″ lg x 1 1/16″ wd x 1¾″ o/a; .006 nom cont separation; oper pressure 6 to 9.5 oz max; momentary; release pressure 4 to 8 oz min; movement differential .0005″ max; pretravel .015″ max; over-travel 7/32″; 15/32″ thd bushing w/2 locknuts, to panels up to ⅜″ thk, ½″ hole; Q spring plunger actuator; solder term for #14 wire; operating point 1½″ nom.	START SWITCH	3Z9558–39.13
V1,V2	TUBE, electron: type 1624, beam tetrode	V1: Oscillator V2: Power amplifier	2J1624

Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
X1 through X3	SOCKET, tube: Sig C Socket SO–11, treated w/Dow-Corning DC-200; 5 cont std; one piece saddle mtg; 2 5/32" d mtg holes on 1 27/32" mtg/c; round steatite body 1 5/16" d x 3/8" h excluding term; phosphor bronze silver pl cont.	Sockets for V1, V2, and spare tube	2Z8711
X4	SOCKET, vibrator: Sig C Socket SO–11, treated w/Dow-Corning DC-200; 6 cont std; one piece saddle mtg; 2 5/32" d mtg holes on 1 27/32" mtg/c; round steatite body 1 5/16" d x 3/8" h excluding term; phosphor bronze silver pl cont.	Socket for vibrator	2Z8676.36
VP1	POWER SUPPLY: synchronous vibrator type; output 500 v, 80 ma; input 6 v DC, 11 amp; 6½" lg x 3" d x 5¾" h; transient filter in secd; mts four #6–32 spade lugs 3 3/42" x 2⅞"; sealed transf, SS chassis and case.	Supply high voltage for plate and screen supply.	3H4330–10.1
	CHARGER: batt; resistance type for d-c power line; 6 v charging; .5 for 1.0 amp continuous; panel mtd 12½" wd x 8½" d x 20⅜" h; 115–230 v DC; incl 6 ft cable term w/female connector; charging rate meter.	To keep batteries in transmitter charged.	3H3995–1
J101	CONNECTOR, plug: 2 cylindrical twist-lock cont; straight; 1" d x 1 3/16" lg o/a; 10 amp, 250 v; 15 amp, 125 v; cylindrical brown bakelite body; cable opening .218" x .312" w/cable grip.	To connect to charging receptacle on transmitter panel to charge battery without removing from suitcase.	6Z3151
F101, F102	FUSE: 3 amp, 250 v; nonrenewable; 3 AG	Protects meter M101	3Z1950
M101	METER, ammeter: DC; type MR24W002DCAA; MIL–M–6A	CHARGING CURRENT meter	3F1002–45
R101, R102	RESISTOR, fixed: WW; JAN type RW39F201; 200 ohms; JAN–R–26A(2).	Current limiting	3RN20123

S101	SWITCH, toggle: DPDT; 20 amp, 125 v; 20 amp, 250 v; ceramic case; $2\frac{13}{16}$" lg x $1\frac{3}{4}$" wd x $1\frac{1}{2}$" d; $\frac{1}{2}$" lg; bakelite toggle handle; nonindicating; screw term; mts two #6-32 screws on $2\frac{3}{8}$" mtg ctrs.	LINE VOLTAGE switch	3Z9858-4.3
S102, S103	SWITCH, toggle: DPST; 20 amp, 125 v; 20 amp, 250 v; ceramic case; $2\frac{13}{16}$" lg x $1\frac{3}{4}$" wd x $1\frac{1}{2}$" d; $\frac{1}{2}$" lg bakelite toggle handle; nonindicating; screw term; mts two #6-32 screws on $2\frac{3}{8}$" mtg ctrs.	S102: LINE SWITCH S103: CHARGING RATE switch	3Z9862-3.3

RESISTOR COLOR CODES



COLOR	SIGNIFICANT FIGURE	MULTIPLYING VALUE	TOLERANCE (%)
BLACK	0	1	± —
BROWN	1	10	± 1
RED	2	100	± 2
ORANGE	3	1,000	± 3
YELLOW	4	10,000	± 4
GREEN	5	100,000	± 5
BLUE	6	1,000,000	± 6
VIOLET	7	10,000,000	± 7
GRAY	8	100,000,000	± 8
WHITE	9	1,000,000,000	± 9
GOLD	—	0.1	± 5
SILVER	—	0.01	± 10
NO COLOR	—	—	± 20

NOTES

* INSULATED FIXED COMPOSITION RESISTORS WITH AXIAL LEADS ARE DESIGNATED BY A NATURAL TAN BACKGROUND COLOR. NON-INSULATED FIXED COMPOSITION RESISTORS WITH AXIAL LEADS ARE DESIGNATED BY A BLACK BACKGROUND.

/ RESISTORS WITH AXIAL LEADS ARE INSULATED. RESISTORS WITH RADIAL LEADS ARE NON-INSULATED.

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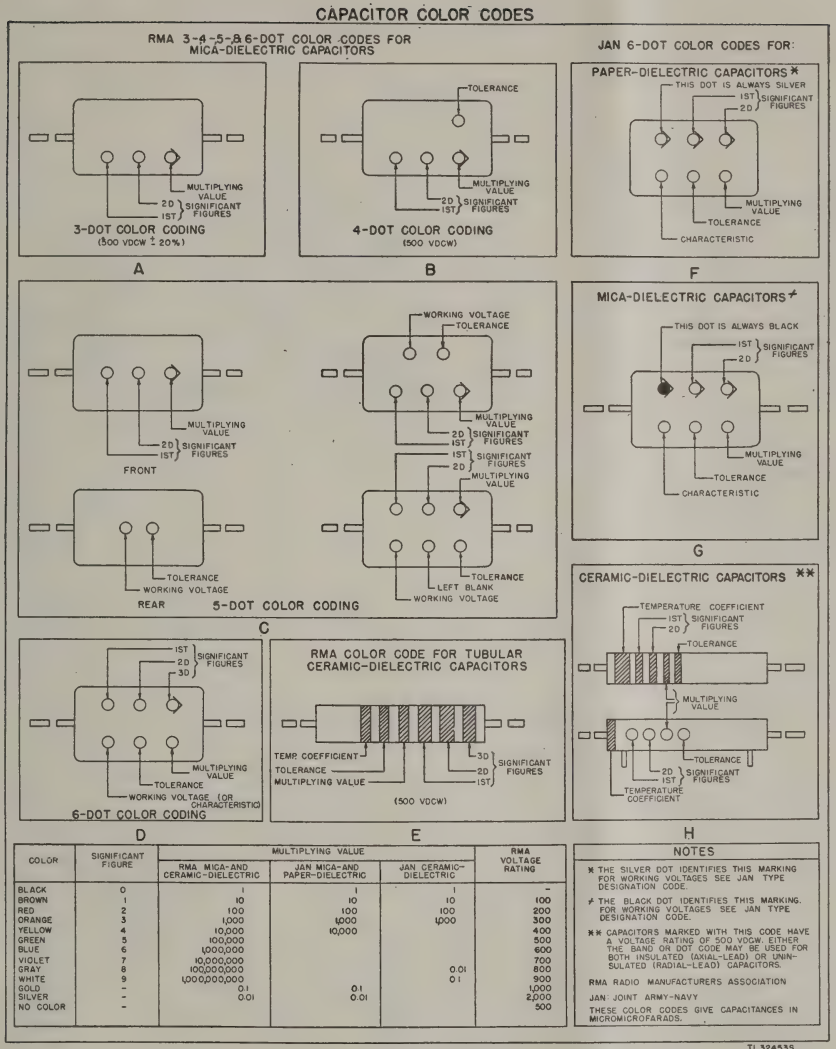
THESE COLOR CODES GIVE ALL RESISTANCE VALUES IN OHMS

Figure 22. Resistor color codes.



COLOR	SIGNIFICANT FIGURE	MULTIPLYING VALUE			RMA VOLTAGE RATING
		RMA MICA-AND CERAMIC-DIELECTRIC	JAN MICA-AND PAPER-DIELECTRIC	JAN CERAMIC-DIELECTRIC	
BLACK	0	1	1	1	-
BROWN	1	10	10	10	100
RED	2	100	100	100	200
ORANGE	3	1,000	1,000	1,000	300
YELLOW	4	10,000	10,000		400
GREEN	5	100,000			500
BLUE	6	1,000,000			600
VIOLET	7	10,000,000			700
GRAY	8	100,000,000		0.01	800
WHITE	9	1,000,000,000		0.1	900
GOLD	-	0.1	0.1		1,000
SILVER	-	0.01	0.01		2,000
NO COLOR	-				500

NOTES

* THE SILVER DOT IDENTIFIES THIS MARKING FOR WORKING VOLTAGES SEE JAN TYPE DESIGNATION CODE.

≠ THE BLACK DOT IDENTIFIES THIS MARKING. FOR WORKING VOLTAGES SEE JAN TYPE DESIGNATION CODE.

** CAPACITORS MARKED WITH THIS CODE HAVE A VOLTAGE RATING OF 500 VDCW. EITHER THE BAND OR DOT CODE MAY BE USED FOR BOTH INSULATED (AXIAL-LEAD) OR UNINSULATED (RADIAL-LEAD) CAPACITORS.

RMA RADIO MANUFACTURERS ASSOCIATION

JAN: JOINT ARMY-NAVY

THESE COLOR CODES GIVE CAPACITANCES IN MICROMICROFARADS.

TL 324535

Figure 23. Capacitor color codes.

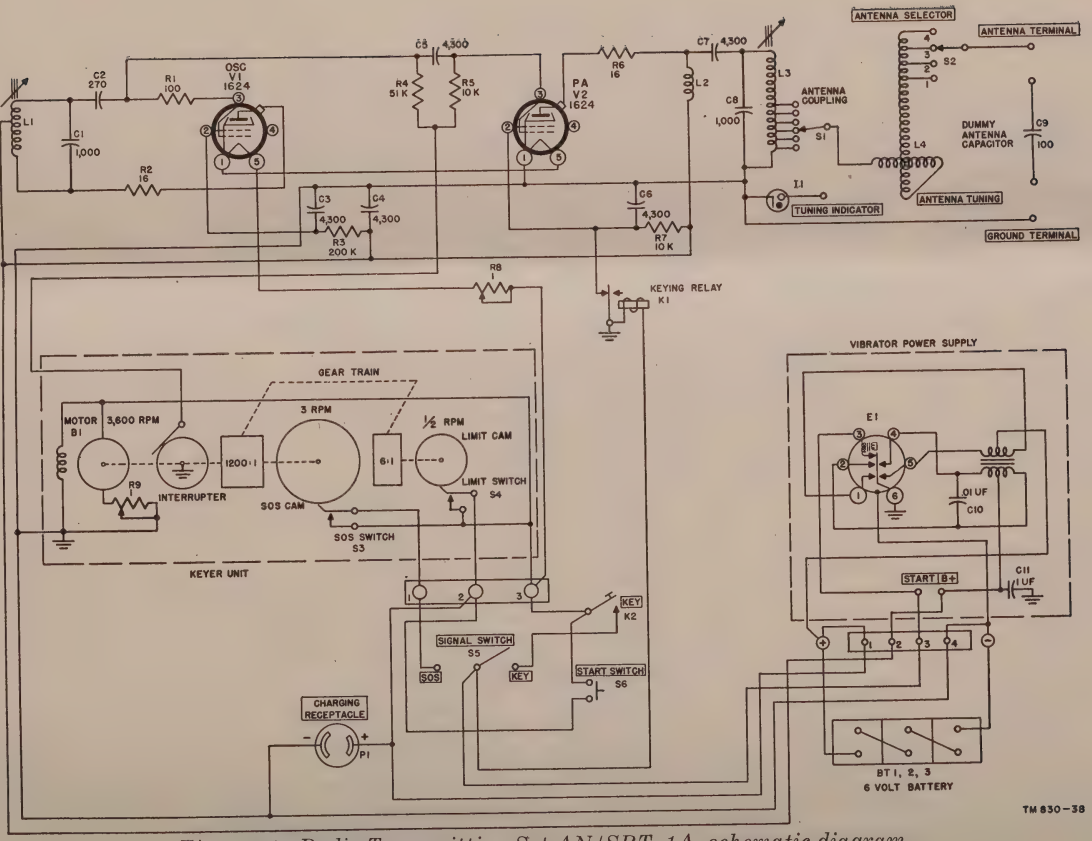


Figure 24. Radio Transmitting Set AN/SRT–1A, schematic diagram.

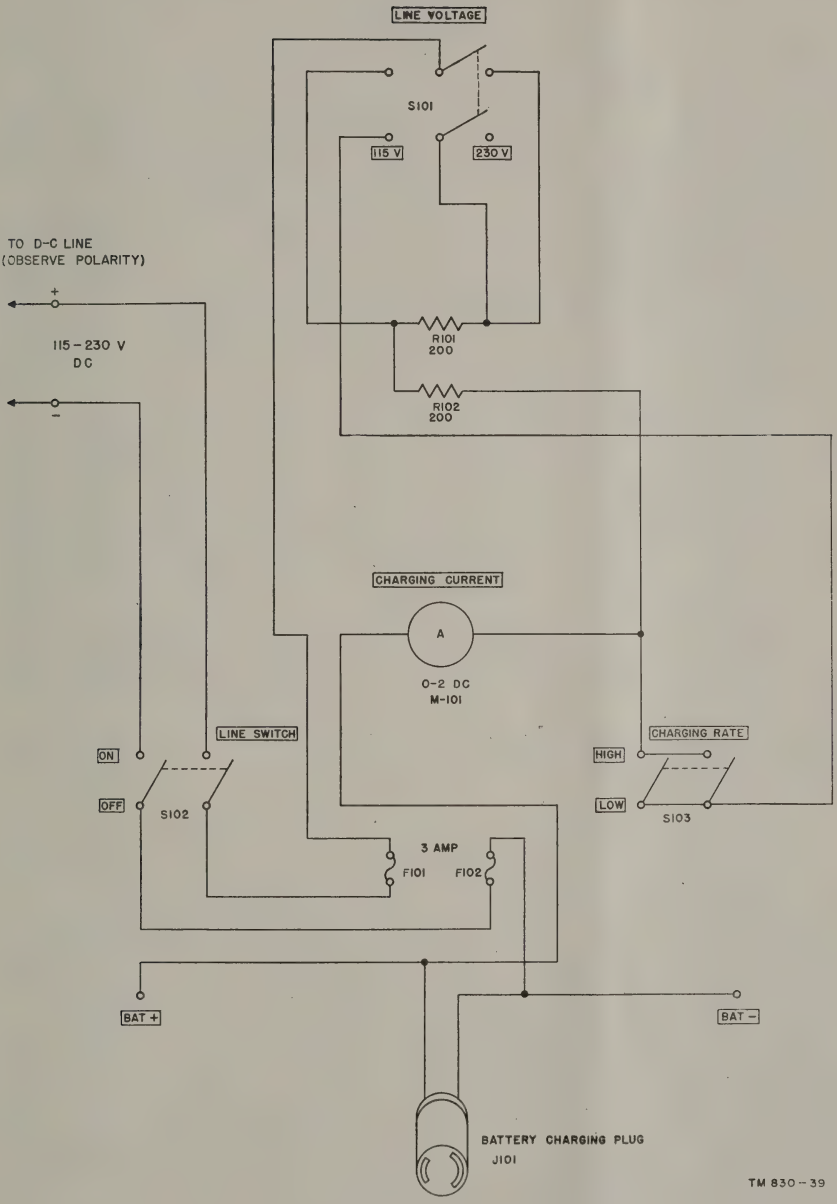


Figure 25. Battery-charging panel, schematic diagram

INDEX

	Paragraphs	Page
Abbreviations	App. I	64
Adjustment, apparatus	50	58
Alinement:		
Antenna circuit	55	61
Oscillator	53	60
Power amplifier	54	60
AN/SRT–1A, Radio Transmitting Set, description and data	3–7	1
Antenna:		
Characteristics	4	2
Circuit	34	40
Coupling switch	17	14
Height	15	13
Installation	15	13
Selector switch	17	14
Tuning adjustments	55	61
Tuning control	17	14
Battery:		
Charge indicators	28	31
Charging	28	31
Checking charge	28	31
Construction	28	31
Maintenance	28	31
Battery and power supply, theory	35	40
Battery-charging panel:		
Description	8	4
Differences in equipment	10	8
Installation	13	9
Technical characteristics	4	2
Theory	38	43
Block diagram, transmitter	31	36
Charge indicators, battery	28	31
Charging current meter, function	18	15
Charging rate switch, function	18	15
Charging spare cells	28	31
Checklists:		
Equipment performance	24	27
Preventive maintenance	27	30
Chopper disk:		
Adjustment	50	58
Function	36	40
Control circuits, theory	37	42

	Paragraphs	Page
Controls:		
Battery-charging panel	18	15
Transmitter	17	14
Data:		
Packaging	6	3
Trouble-shooting	40	48
Description and data, Radio Transmitting Set AN/SRT–1A	3–10	1
Differences in equipment:		
Battery-charging panel	10	8
Radio Transmitting Set AN/SRT–1A	10	8
Emergency trouble shooting	22	22
Equipment performance checklist	24	27
Forms and records	2	1
Frequency adjustment	52, 53	59
Frequency of operation	3	1
Ground installation	15	13
Height, antenna	15	13
Hydrometer, use of	28	31
Identification table of parts	App. II	66
Indicator, tuning, function	17	14
Inspecting transmitter	43	50
Installation	11–16	9
Antenna-ground	15	13
Battery-charging panel	13	11
Transmitter aboard ship	14	11
Transmitter in lifeboat	15	13
Tubes	14	11
Interrupter disk:		
Adjustment	50	58
Theory	36	40
Key, function	17	14
Keyer unit:		
Adjustment	50	58
Replacement	48	57
Theory	36	40
Keying relay:		
Replacement	50	58
Theory	37	42
Limit switch, adjustment	50	58
Line switch, function	18	15
Line voltage switch, function	18	15
Localization of trouble	39	47
Lubrication	29	33
Maintenance:		
Battery	28	31
Field	39–56	47
Organizational	25–30	30
Preventive	27	30

	Paragraphs	Page
Modulation, type used	4	2
Morse code (fig. 9)		
Motor speed, adjustment	50	58
Operation:		
General notes	21	21
Important instructions	20	20
Lifeboat	19	18
Shipboard	23	27
Oscillator stage:		
Theory	32	37
Tuning	53	60
Packaging data	6	3
Power amplifier stage:		
Theory	33	37
Tuning	54	60
Power input:		
Battery-charging panel	4	2
Transmitter	4	2
Power output:		
Battery-charging panel	4	2
Transmitter	4	2
Power supply:		
Characteristics	4	2
Tests	44	52
Preventive maintenance:		
Checklist	27	30
Definition and importance	25	30
Purpose and use of equipment	3	1
Range	3, 4	1, 2
References	App. I	64
Refinishing	49	57
Relay, keying:		
Adjustment	50	58
Theory	37	42
Repair and test equipment	41	49
Replacement of parts	48	57
Running spares	9	5
Sectionalization of trouble	39	47
Shipment and storage	57–59	62
SIGNAL SWITCH, function	17	14
Signal, type transmitted	4	2
SOS switch, adjustment	50	58
Spares, running	9	5
START SWITCH, function	17	14
Table of components	5	3
Technical characteristics	4	2
Telegraph key, adjustment	50	58
Test and repair equipment	41	49
Testing, final	56	61
Theory	31–38	36

	Paragraphs	Page
Transmitter tuning	51–55	59
Trouble-shooting chart	46, 47	53, 56
Trouble-shooting procedures	39	47
Tubes:		
Functions	32, 33	37
Installation	14	11
Required	4	2
Spare	14	11
Tuning	51–55	59
Unpacking	12	9
Vibrator, connections and testing	44	52
Weatherproofing	30	35
Weight	4	2

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